Title Understanding the Educational World of the Child: exploring the ways in which parents' and teachers' representations mediate the child's mathematical learning in multicultural contexts

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Understanding the Educational World of the Child: exploring the ways in which parents' and teachers' representations mediate the child's mathematical learning in multicultural contexts

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This dissertation is an account of my own work undertaken as a research student in the University of Luton, Department of Psychology and it includes nothing which is the outcome of work done in collaboration. No part of this dissertation has been or is being submitted for any other degree, diploma or other qualification at this or any other University and specific acknowledgement is made in the text where I have availed myself of the work of others.

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SUMMARY

This study investigates the ways in which parents' and teachers' experiences and representations mediate their child's mathematics learning as they make the transition between home and school to either a multiethnic or mainly white school. In particular, it examines if the forms of mediation they adopt can shed light on the academic success of the child in school mathematics. The focus on mathematics learning has been chosen for the study because of its relative neglect, until recent times, to be seen as a subject influenced by cultural representations. Furthermore, there are significant implications in the relative neglect of understanding the achievement of ethnic minority pupils in mathematics.

The research was framed by Vygotskian sociocultural theory and Wenger's (1998) communities of practice to explore the construction of meaning, identity and representations of practice. The amalgam of Wenger's communities of practice with sociocultural theory provided three key theoretical facets: (i) multiple levels of understanding in the form of meaning, practice and identity, (ii) the scope to explore the social and cultural worlds of the learner and (iii) understanding the ways that past experiences impact on current practice.

Three different forms of qualitative data collection were used within the context of an ethnographic approach: (i) investigations in the form of classroom observations, (ii) in-depth semi-structured interviews and (iii) a child identity task. Twenty-two parents, eight teachers and fifty-eight children took part in the interviews, which form the main part of the data analysis. Out of these fifty-eight children, twenty-seven undertook the child identity task. The research took place in three schools with different ethnic make-up: a multicultural school, a mainly white school and a predominantly South Asian school. Two year groups were chosen, year 2 (ages 6/7 years) and year 6 (10/11 years), balancing high and low achievers.

This study has provided data, which suggests that the way parents and teachers mediate the child's learning involves more than representations of mathematics. In making meaning of the mathematical, they draw on wider representations of the educational world, which include aspects like child development, notions of achievement, past experiences and the child's projected futures. This complex picture emerged from studying the highly interwoven aspects of the construction of meaning, identity and representations of practice. Representations of learning can be borrowed from both communities, providing the ethnic minority pupil with the potential to create hybrid representations of learning as they make the transition between home and school, which may be attributed a cultural status within the home. Each social actor has the potential to borrow from the home or school community to a greater or lesser degree. If the gap between the shared representations of the home and school are large, then this increases the likelihood of difficulties for the child in transition. However, the data suggests that even if the cultural representations of the home are very different from the school, the identification of high achievement and the engagement in mathematical activity at home can still provide success in learning.

From the school community perspective, classrooms were represented by the teacher informants as 'cultureless' in both the multiethnic and mainly white school. For example, in the multicultural school the teachers felt that there were so many ethnicities that differences were not visible. In the mainly white school, there were so few ethnic minority children that teachers also struggled to identify issues of culture. In the predominantly South Asian school, issues surrounding culture were brought to the forefront of the teacher discourse. However, in many ethnic minority homes, parents described how culture was influential in mediating representations of learning. This has implications in the educational arena with respect to the teachers' understanding of the transitional process that ethnic minority children undergo and the levels of visibility that culture and ethnicity is given in the school community.

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Chapter one: Why study learning in multiethnic contexts?

1.1. The debate in the educational arena

The education of multiethnic learners is a subject that continues to be strongly debated in the fields of psychology and education. The school performance of children from different ethnic groups in England is an area of concern for education authorities because of the gaps between different groups. On one hand there are some ethnic groups who consistently achieve on or above the mainstream White British group, while some groups consistently achieve below (DfES, 2003; Gillborn & Mirza, 2000).

From a historical perspective the Swann Report (1985) led the way for a number of major discussions concerning the education of ethnic minority pupils. The catch phrase 'Education for All' epitomised the message that Britain was a multicultural and diverse society, and that this diversity should be reflected in the curriculum taught in schools. Interestingly, a substantial body of research has since focused on the performance of one particular group over another, achieving little more than a regurgitation of GCSE[1] results, ad hoc, with little understanding of the school culture, and parent and teacher expectations surrounding the child throughout their education. The pitting of one ethnic group over another has tended to overshadow the sociocultural composites of school practices. The reality

[1] GCSE's are standard examinations taken when children reach sixteen years of age in the UK.

is that many schools in Britain today consist of classrooms that are not dominated by one ethnic group, but are composed of many different cultures and ethnic groups. What impact the multicultural classroom has on the child's learning is a question that has yet to be addressed.

The Cockcroft Report, *Mathematics Counts*, published in 1982 was influential in political and educational spheres in the UK for highlighting issues that specifically revolved around the teaching of mathematics. The report referred to two matters relevant to the current research study, (i) the role of parents in the child's mathematics learning and (ii) the teaching of mathematics to ethnic minority pupils. The influence of parents on their child's home mathematics learning does not go unmentioned in the Cockcroft Report, although in terms of the whole report it occupies a fairly small part. What the report was clear in stating was that schools should make an effort to enlist the help of parents in mathematics and explain to them the present approaches to mathematics that were going on in the classroom. What was less clear was how this was to be done. Furthermore, very little space in the Cockcroft Report was devoted to the teaching of mathematics to pupils who come from ethnic minority backgrounds. Even then, the problems encountered by ethnic minority pupils learning mathematics are only addressed at the level of language proficiency, revealing a lack of understanding about the social and cultural nature of mathematics learning addressed in later sections of the present chapter. A review of the success of ethnic minority pupils and mathematics learning in the United States also confirmed that there were ethnic group differences in the mean mathematic achievement scores (Tate, 1997).

In 1988 the Education Reform Act was introduced in the British education system, which prompted the onset of the National Curriculum and led to a number of reforms to the way the curriculum is administered. Prior to the introduction of the National Curriculum there was no mandatory official curriculum and teachers had greater freedom over how the content and structure of the curriculum was administered (Ivinson, 1998). Up until this point it had not been customary for teachers in mainstream education to give children homework during the primary school years (ages 5 to 11 years). Instead lessons were delivered according to broad thematic topics like 'Water' or 'The Egyptians' the curriculum was split according to subject. The three 'core' subjects were English, mathematics and science and the other foundation subjects were history, geography, technology, music, art, physical education and religious education. The next major reform came with the onset of the National Numeracy Strategy (1999). Most notably, the National Numeracy Strategy introduced a number of new teaching procedures, strategies and alterations of delivery of the lessons to the child's learning experience[2]. This raised a general issue for the role of the home community on the children's mathematics learning because of the differences in mathematical experiences of the generation of parents whose own schooling took place prior these changes. Even if a parent has been educated within the British school system their experience of school mathematics learning will be very different from that of their child.

[2] The children's mathematics lessons are known as the 'numeracy hour' and a fuller description of the numeracy hour can be found in chapter three

In a recent consultation document looking at raising the achievement of ethnic minority pupils (DfES, 2003) the promotion of high expectations and aspirations towards and on behalf of ethnic minority pupils was proposed. This involved a 'whole school approach to achievement' incorporating change at the teacher, Head Teacher, curriculum and parental and community levels. These documents did not appear to consider that there are some schools, which are not dominated by one particular ethnic minority group, but consist of a multitude of different ethnic and cultural groups within the context of one classroom. This reality has been neglected within both educational and psychological spheres.

This section has provoked three major questions for the current study (i) what role do parents play in the learning of mathematics in the home, particularly for children from ethnic minority backgrounds, (ii) what is the impact of attending a multicultural classroom on the learning of mathematics, and (iii) are the representations, aspirations and expectations of ethnic minority parents and the school about mathematics learning mismatched?

The next section of this chapter will frame the debate surrounding the gap in educational policy of the achievement of ethnic minority pupils to that of research in cultural-developmental psychology.

1.2. The debate in cultural-developmental psychology

Cultural-developmental psychology has yet to understand why children from some ethnic groups are more likely to fail at school while others succeed (Abreu,

2001). Research has yet to fully comprehend how to deal with diversity in education without attempting to eliminate diversity from the situation (Cole, 1998). Perhaps more importantly, research in education and culture remains largely segregated from educational policy and practice. This calls to question how cultural-developmental psychology can be used to guide educational practice, particularly in settings where children come from many different ethnic and cultural backgrounds.

Firstly, there is a suggested move away from focusing solely on the construct of 'race' (i.e. Black Caribbean) as the only descriptor for understanding ethnic and cultural diversity (Lee, 2002). As reported above, the propensity for this type of categorisation in educational and psychological research has led to an understanding of some 'racial' groups as deficient (Gallimore & Goldenberg, 2001). One solution to reduce this problem is to examine both *between* group and *within* group differences (Goodnow, 2002; Abreu, 1995, 2001, 2002; Cole, 1998). Cultural psychologists also recommend taking social and cultural practice as the unit of analysis of study. As Lee (2002) points out, this allows us to understand why individuals, who are racially classified under a particular grouping, participate in cultural practices and maintain representations that are outside of that categorisation. In doing so, the increasingly complex situation of mixed heritage and longstanding generational immigration settlement would allow cultural communities to be defined by social practices. For example, a British born Indian may recognise themselves as belonging to three different

communities: the national British community, the Indian-British community and the Indian community.

Interrogating the role of cultural-developmental psychology in the educational realms raises new complexities because it encourages researchers to acknowledge that learning takes place both inside and outside the school community. The impact of ethnicity and culture as it is represented in the home community is put into question. Therefore, culture is seen as a mediational means of understanding representations of learning and development (Cole, 1995) and this study seeks to understand how cultural psychology can share in new ways of looking at development. The focus on culture will help to ask the extent to which shared meanings, experiences and representations exist between (i) two different learning communities of home and school and (ii) in multicultural settings where children come from many different ethnic backgrounds? This chapter will now focus more specifically on the home learning community and the role of the parents[3].

1.3. Home learning community and the role of parents

Previous educational and psychological research has tended to place too much emphasis on homework when looking at the role of parents in the child's home learning (Cooper,1989; Edwards & Warin,1999; Farrow, Tymms & Henderson,1999; Georgiou, 1997). The influence of parents on the child's school learning encompasses a great deal more than the time allocated to help with homework. Home learning practices are embedded in the routines of family life,

[3] All references to parents throughout this thesis also equally apply to other carers and guardians.

which in turn are embedded in the larger societal and cultural context (Bronfenbrenner, 1979; Cole, 1996; Rogoff, 2003). Home learning practices are influenced by parents' constructions of the child and the child's perceived capabilities (Soloman, Warin & Lewis, 2002). The precise form in which home learning is delivered depends on the parents' understanding of the individual child and their development. Parental involvement in home learning is complex because it takes many subtle and complex forms. The knowledge that parents bring to the home learning situation is heterogeneous because of their own varied educational and cultural experiences. This is supported by Bryans (1989) who stated succinctly at the time of the introduction of the National Curriculum that, "The main problem is that many parents' expectations of school are shaped by their own experience of having been pupils themselves" (pp. 36). In the past this has led to a model of parent as deficient or unwilling to co-operate with their children's home learning (Edwards & Warin, 1999). More recently, and as a generalisation, this notion has been refuted by key researchers in education like Tizard, Schofield and Hewison (1982), Hannon (1987), Greenhough and Hughes (1999) and Holden, Hughes and Desforges (1996), who claim that very few parents do not want to see their children succeed in school. Instead of a deficit model of the parent and a stereotyped view of their heterogeneity, the major assumption in this study is that parents' particular life experiences have resulted in them developing specific understandings of what counts as mathematical learning, how this connects to child development and how they represent their role in this process. Referring to representations and experiences is a way of considering that distinct ethnic groups may share some experiences derived from a common

cultural heritage, while at the same time enabling the exploration of variations among members of each ethnic group. As Rogoff (2003) argued "individuals connect in various ways with other communities and experiences" (p. 12).

The situation is accentuated when taking into account the multicultural nature of the home mathematics learning environments. As Nunes (1999) points out, children do not enter school without some mathematical knowledge, although the extent of their knowledge may vary greatly. Most children prior to going to school have at least begun to learn to count. However with children coming from many different ethnic backgrounds, the system for counting and the favoured methods of learning may be quite diverse and there may be a variation in the extent to which numeracy has been part of home life. But as discussions surrounding home numeracy increase, it becomes obvious that certain mathematical practices are valued over others. As Goodnow (1990) points out, 'we do not simply learn to solve problems. We learn also what problems are considered worth solving' (pp. 259). In view of this the current research study asks the following question: what mathematical practices do parents claim to engage in at home with their children, taking into account the unique diversity of representations and experiences surrounding mathematics learning in multiethnic communities?

1.4. The social and cultural nature of mathematics learning

Recent research in mathematics has begun to show that learning is strongly influenced by the social and cultural aspects of numeracy practices (Abreu & Cline, 2003; Street, Baker & Tomlin, 2001; Atweh, Bleicher & Cooper, 1998;

Hughes & Greenhough, 1998). The broader view of the social nature of mathematics draws on values, beliefs, expectations, experiences, relations and social institutions. The two institutions of home and school are both contexts where the social and cultural influences on learning can be very powerful. In a multicultural school, the social diversity within the classroom is expressed through the distinct culturally constructed knowledge from home and the effect it has on the representations, experiences and expectations for each child.

In the last decades research into the impact of home practices on the child's school learning have suggested that particular home backgrounds equip the child with forms of knowledge which are similar to the ones required for success in school. Since the seventies a main tendency has been to explore ways of knowing of particular groups describing uses of specific systems of representation. For instance, within the sociological tradition, the work of Bernstein (1972) showed how the use of language for communication in middle class groups in England, resembles what was required in schools, while a working class style was more distant. Following an anthropological tradition, the work of Heath (1983), in the USA, found that language differences can be much more subtle and be linked to the meanings cultural groups attribute to specific activities. Recently, Gallimore and Goldenberg (1993) reviewed a series of studies in which they had investigated literacy practices of American-born Latino families. They found that a key factor in the way the activities were framed was the parents' representations of school literacy. They found that "as soon as the parents construe an activity as the 'teaching of literacy', their prevailing conception of literary development is

activated, driving the interaction and determining the script-in-use" (pp. 328-329). For instance, they found that parents overemphasised correct answers (e.g. reading a word accurately) to the detriment of reading for meaning. Though there are grounds to speculate that similar subtle processes may be in operation regarding the relationship between home and school mathematical practices, this is an area under-researched.

The research described in this thesis, like the arguably more advanced work into home literacy, details family numeracy practices to include a wide range of varied practices in a number of different contexts (Topping, 1996). Street, Baker and Tomlin (2001) have borrowed from the research in literacy to reveal the varied ways in which numeracy is undertaken in the home and school sites. In their analysis of home numeracy practices Street, Baker and Tomlin (2001; see also Tomlin, Baker & Street, 2002) address the problem of what counts as mathematics. They explore in their research those practices which are more visible or explicit numeracy practices and are recognised by all concerned as improving mathematical skills. However, some numeracy practices are viewed as less salient, or are more implicit, because they often go unrecognised as contributing to the mastery of mathematical skills. There are a number of crossovers between schooled numeracy and out-of-school numeracy practices such as working on number bonds, times tables, dates, measuring, money and playground games. Other practices such as homework and shop bought textbooks also transcend both contexts. Out-of-school numeracy practices like laying the table, counting stairs, setting the video and producing calculations from looking at

car number plates reveal how varied numeracy learning can be. These examples further highlight how much the uses of home numeracy practices are reliant on the social characteristics of engaging in numeracy. Therefore, this thesis raises issues about the differences between those parents who have a deeper understanding of the usefulness of implicit numeracy practices, thereby turning them into explicit numeracy practices. And more importantly, the extent to which implicit numeracy practices develop into an explicit influence on the child's numeracy learning.

1.5. Discussion

This study seeks to understand the representations and experiences of members of the communities of home and school when they belong to either a multicultural or mainly white school. The medium of mathematics learning has been chosen for the study because of its relative neglect, until recent times, to be seen as a subject influenced by cultural representations. Furthermore, there are significant implications in the relative neglect of understanding the achievement of ethnic minority pupils in mathematics. Therefore, one question that always has importance in educational research is why some children succeed in mathematics while other children fail and does the way parents mediate in this process play a role in the child's achievement? Also, what is the impact of learning mathematics in a school where children come from many different ethnic home communities?

Thus the main focus of this research is:

> The investigation of the ways in which parents' and teachers' experiences and representations mediate their child's mathematics learning as they make the transition between home and school to either a multiethnic or mainly white school. In particular exploring if the forms of mediation they adopt can shed light on the academic success of the child

In the next chapter the thesis will attempt to frame the debate within the context of the theoretical ideas borrowed from Vygotskian sociocultural theory (See Vygotsky, 1978) and Wenger's (1998) communities of practice. These theories provide concepts, which will underpin the exploration of the problematic of children's mathematics learning in multiethnic schools.

Chapter two: Using sociocultural theory and communities of practice to understand learning in multiethnic contexts

2.1. Introduction to the theoretical framework

The theoretical framework utilises the complementary approaches of Vygotskian sociocultural theory (see Vygotsky, 1978; Cole, 1996) and Wenger's (1998) communities of practice to understand the social and cultural nature of mathematics learning. The philosophical underpinnings of these two theories (Cole, 1996; Packer & Goicoechea, 2000) are supported in their analysis of the origins of the inseparability of the individual from the environment. Within the context of this research, the act of learning is associated with the context of the 'lived-in world' and as part of a social practice (Lave & Wenger, 1991; pp.35).

The classroom is arguably a context where learning is inherently part of the social practice. However, the abstract relationships established at the level of the teacher and the institution serve to support the separate nature of mind from context. A class of children are taught to operate as one, follow classroom rules and frequently hear phrases like 'put your thinking cap on' and 'get your brain into gear'. This long-standing tradition isolates the classroom from the outside context, and places an emphasis on learning as situated within school. Utilising sociocultural theory and communities of practice in unison challenges the

antinomy of classroom community versus home community or individual versus society.

The theoretical positions presented in this research reinstate the importance of both the home and school communities in mediating certain representations like meaning and identity. Representation refers to a way of understanding the way the world works in a meaningful way. If something is unfamiliar we create meaning or a way of comprehending, which then becomes a representation. As the present chapter progresses it will become clear that the notion of 'representations' ties in well with Wenger's (1998) communities of practice, which looks at meaning, practice and identity. A representation is more than an attitude or perception of a behaviour but refers to meaning in a broader sense. Meaning does involve that which is cognitive, but also involves values, traditions, beliefs and identity. Representation then is more than a "discursive" device, it is a concept that enables the social actor to re-present their past experiences and also to anticipate the future and to make sense of the present. Therefore, traditional concepts such as parents' perceptions, attitudes are different from a representation. The relationship between representation and practice will be addressed in section 2.3.1.

2.2. Vygotskian sociocultural theory

Sociocultural theory began with the premise that children, in their development, reconstruct the cultural knowledge from the previous generations of communities they belong to (Vygotsky, 1978). Therefore, a child's development is neither a singular maturational process, nor does it exist without an historical basis

(Hedegaard, Chaiklin & Jensen, 1999). All too often developmental research has focused on a singular element, or a singular person to understand the context of their lives. Independent actors in the social situation have tended to constitute the whole construction, separate from their environment or other key figures in the process. Vygotskyian sociocultural theory seeks to understand the mutuality of person and environment (Rogoff, 1995; Wertsch, 1985; 1995) and the present research acknowledges that in the context of the child's school learning it is the influence of person(s), plural, and the environment that is important. In doing so, there exists on two levels the social actors that figure in a child's mathematics learning and the socio-cultural environments the child is engaged in.

Sociocultural theory addresses the socially organised activities that are undertaken as part of every day routines, which are profoundly influenced by the history of communities and individuals. For sociocultural theorists, it is through participation and engagement in socially organised activities that psychological processes are developed. However, as cautioned by Ratner (1999) sociocultural theorists who have followed an activity approach often disassociated the activities from the social system in which they are situated. Ratner (1999) also suggested that Vygotskian based research often overlooked the wider social and economic features by attending primarily to the micro perspective of face-to-face interactions. This may have been the case, but this inadequacy has been addressed through approaches, which explore the relationships between the multiple contexts of human development (Bronfenbrenner, 1979; Cole, 1996; Abreu, 2000). Cole (1996) describes the multiple contexts of the learner as concentric

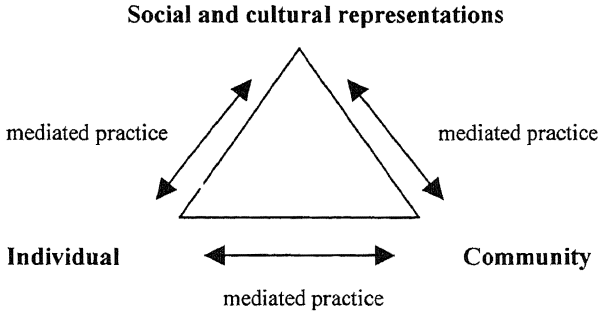
circles, with the activity placed at the centre, and bears similar resemblances to Bronfenbrenner's (1979) ecology of human development. Both models use school learning as an example of how multiple contexts can be depicted. Cole's (1996) concentric circles place a particular 'event' at the centre of the context. It is then shown how this event is 'interwoven' with multiple layers of context (pp.135). Placing an 'event' at the centre of the context reduces the possibility of studying learning in more than one community. Bronfenbrenner's model, on the other hand, suggests that home and school both lay at the centre of the context, which he refers to as the microsystem. The microsystem is characteristic of settings where face-to-face interactions are situated (Abreu, 2000), which allows the home context to play a greater role in the child's learning. Bronfenbrenner's model is particularly important to this research study because the author seeks to look beyond a focus of just one community of practice.

Sociocultural theory has been adapted to allow both the social and cultural contexts to be understood as well as the cognitive aspects of school learning (Abreu, 1995). This work has been extended into mathematics learning (Abreu, Bishop & Presmeg, 2002; Abreu, 1995; Khan, 1999; Schliemann, 1998; Schliemann et al. 1998; Schliemann & Nunes, 1990). Vygotskian contributions to our understanding of cultural development have been fundamental in foregrounding the idea that individual development is primarily influenced by society and the way society culturally develops over time. Sociocultural theory seeks to bridge the gap between the cultural history the child is immersed in, and the child's current development.

2.2.1 Social mediation in learning contexts

The notion of mediation is widely used in sociocultural approaches to explicate relationships between the person's psychological development, on one hand, and the social, cultural and institutional contexts, on the other. The use of cultural tools has been a focus for a number of studies within the sociocultural tradition. Following on Vygotsky's ideas, two aspects of mediation were intensively researched in empirical studies in the 1970's and 1980's. These aspects were mediation of thinking by a particular cultural tools and mediation of learning by an expert in face-to-face interactions (for a review see Abreu, 1999). Recognising the restricted manner in which mediation was analysed in this early work during the 1990s, expanded notions of the concept were articulated (see for instance, Cole, 1995; Cole, 1996; Wertsch, 1995; Wertsch, Del-Rio, & Alvarez, 1995). In these new formulations aspects of mediation foreground for analysis included cultural and social representations, such as, the meanings and identities that a community attaches to particular uses of cultural tools and social roles. Moreover, both cultural and social representations evolve in the history of societies and individuals and this is another dimension in mediation, which needs to be considered. The following diagram has been modified by the author from Cole's (1996) depiction of artifact-mediated practice (Fig. 1).

Fig. 1 A diagram showing the mediation of learning in a community of practice



In order to explain how mediation works when it is used as part of a community of practice it is worth turning to Cole (1996) for assistance. Cole (1996) described three levels of artifact mediation, which are primary artifacts (the use of more concrete objects like tools for work), secondary artifacts (representations of primary artifacts and modes of action) and tertiary artifacts (notions of understanding or representing the world). Level three, tertiary artifacts, is most appropriate for describing the kind of mediation, which corresponds with social and cultural representations formed as part of participation in a community of practice. The diagram above also shows the possible reciprocity of social and cultural representations as they are mediated between the individual and community.

While sociocultural theory has promoted a theory of cognition as it is influenced at both the individual and social level, proponents of the theoretical stance have at times been remiss in stating how these two levels are related. Wenger's more recent work has evolved previous understandings of the ways in which learning is

situated individually and socially, by looking at four different features of belonging to a community of practice.

2.3. Wenger's communities of practice framework

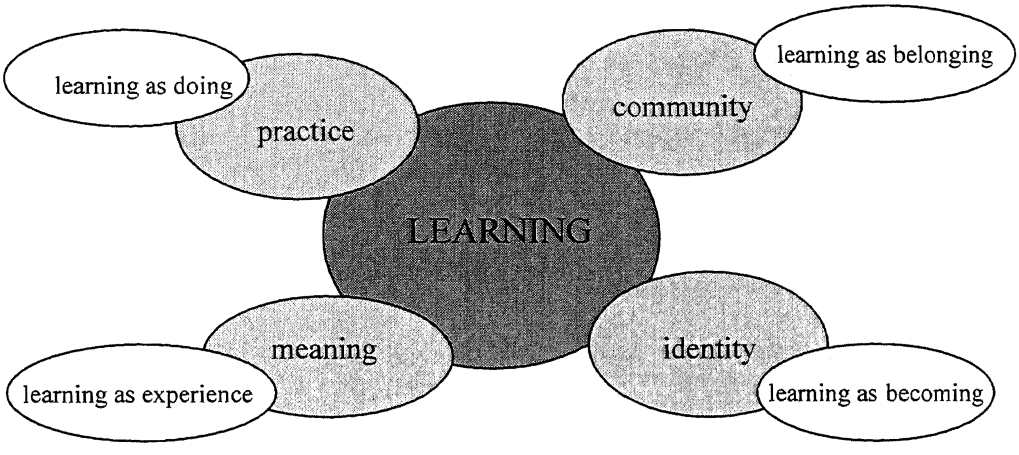
The theory of communities of practice (COP) is a conceptual framework for understanding learning as socially situated (Wenger, 1998). As a model it develops the notion that learning takes place through the participation in certain communities, which shape the meanings and identities we construct as a result of being part of that community of practice. Prior to the development of the communities of practice framework, Lave and Wenger (1991) and Lave (1988) developed the notion of situated cognition, whereby learning was viewed as an integral part of social practice. The authors were among early theorists rebelling against the idea that individuals are merely as receivers of information, who exercise very little impact on the external environment themselves (Pontecorvo, Fasulo & Sterponi, 2001). Lave and Wenger (1991) developed the notion of Legitimate Peripheral Participation, which promoted learning as an inseparable part of everyday social practice. School education is a particularly pertinent example of the way learning is seen as detached from any outside context. Arguably, this separation has become more pronounced since the onset of the National Curriculum as a result of the compartmentalised way in which subjects are delivered[1]. This criticism of more traditional theories of learning proffered by the situated cognition theorists led a number of researchers to extend the situated learning theory to mathematics by studying street vendors (Schliemann, 1998;

[1] Chapter one describes in detail the way the National Curriculum is structured

Schliemann et al., 1998; Khan, 1999), Brazilian fishermen (Schliemann & Nunes, 1990) and Brazilian farmers (Abreu, 1995, Abreu, 2000; Abreu, Bishop & Presmeg, 2002) to demonstrate the numerous ways in which mathematical practices are undertaken in learning contexts other than school. Wenger (1998) then went on to develop his previous work with Lave when he wrote about communities of practice.

Wenger suggests that being a participant in a community shapes what we do and the way we do it, as well as influencing who we are. The framework therefore lends itself well to working mutually with sociocultural theory because both theoretical ideas work towards understanding cognition in a social context. Communities of practice addresses learning on four major complex levels, which are; (i) community, (ii) practice, (iii) meaning and (iv) identity. Wenger shows the basic components of his framework in the following way (1998, pp. 5).

Fig. 2 A diagram showing the components of Wenger's communities of practice framework



This chapter is now going to look at each of the components of the communities of practice in greater depth, although it is important to remember that Wenger preferred that his model be considered as an overarching framework. Furthermore, where necessary, the current study has built upon Wenger's theory with concepts borrowed from other researchers. This is because a number of other researchers, particularly proponents from the sociocultural tradition, have looked in depth at aspects that might influence the components of the framework to a greater extent than Wenger. For example, while Wenger recognised the importance of history as inseparable from the practice that has evolved with it, the issue is not explored sufficiently. Therefore the conceptualisations borrowed from other researchers have contributed increasing depth and richness to that already supplied by Wenger himself. The discussions now turn to the four major aspects of the communities of practice framework.

2.3.1 Community and Practice

Beginning with 'practice', the description of 'learning as doing' exemplifies how the learner is more than a receiver of knowledge. Practice is a way of 'experiencing the world', which has been influenced by both the historical and social context in which the practice is situated (Wenger, 1998; pp.51). Wenger's (1998) use of the term 'practice' is an inclusive one and is not used in the dictionary sense, to perform an activity repeatedly until it has become a skill, although this would be included. The notion of representation fits well here because representation looks beyond pure 'action' to the level of making meaning, which in turn has the potential to influence practice. For Wenger, a practice is not

just what is done, but what is not done. It encompasses those elements, which distinguish that person as belonging to that particular community. Practice is important because there is a conceptual recognition that learning through participation is a process of change occurring for the individual and the social environment in which they are situated. Practice is inclusive of those elements of a community such as language, tools, documents and roles; essentially what sociocultural theorists have been describing as artifacts for some time.

Being part of a community or 'learning by belonging' is inextricably linked to the undertaking of a practice within the community. Our communities define what practice is worth undertaking and measure through participation the success of our endeavours. Wenger (1998) rightly proposes that communities can be both diverse and inharmonious. Communities of practice maintain discontinuities as well as continuities. Other researchers expand this issue by suggesting that for some learners, dis-identification can occur whereby the individual rejects the community into which they are placed (Hodges, 1998; Linehan & McCarthy, 2001). This is particularly applicable to the classroom context because being part of a school community is not a choice for most children. If a child chooses or feels it is necessary to reject this community, they are still required to go to school. These criticisms of the communities of practice framework can be extended when issues of identity are discussed in greater depth below.

While school children can readily be said to belong to a community of practice at both a classroom level and a school level, the perspective and position of the

parents is a little more difficult to define. Parents are not full participants in their child's classroom practices, so from the parents' perspective the family is to some extent on the 'periphery' (Wenger, 1998; pp.117) of the child's school community. The child's relationship with the communities of practice is a complex one, as moving between home and school can place big demands on the child in terms of the transformations they must make. The issues surrounding transitions between home and school are discussed in more depth below.

The current research programme is concerned with the two major communities of home and school, but they are not isolated aspects of the child's life and the practices that the child engages in within these two communities have the potential to share representations. However, home and school are separate institutions and only the child experiences both communities directly. In terms of the child's mathematical learning, parents and, to a lesser extent, teachers have limited access to what the child is experiencing in their respective communities of home and school. One might surmise that for some parents the mathematical practices and representations of learning are similar to those of the school, but for other parents there may exist a 'gap' in the understanding of the educational world of the child.

2.3.2 Practice in the form of engagement in mathematical activity

There are two conceptual problems to be faced when looking at the engagement in mathematics as an activity. The first is that numerical practices can be embedded in the course of everyday social practice to such an extent that the members in

question (in this instance, parents and their children) have little or no awareness that they are doing it. The second is that the two institutions of home and school are both contexts where the social influences on learning can be very powerful. In a multicultural school, the social diversity within the classroom is very apparent, with culturally constructed knowledge from home impacting on the values, experiences and expectations for the child. The types of mathematical knowledge that are valued within these two contexts may be quite diverse and the extent to which they are mutually constitutive and constructive has yet to be established.

Gallimore and Goldenberg (2001) provide an interesting framework for being able to understand and incorporate the links between the child's achievement in school and their engagement in school-based activities at home. More importantly, these activities are seen by the authors to be influenced by culture. Their framework presents two units of analysis, which they refer to as 'cultural models' and 'cultural settings'. Cultural models can be understood in terms of a shared understanding of how the individual perceives the way the world works, or should work. A cultural model is described as:

> Encoded shared environmental and event interpretations, what is valued and ideal, what settings should be enacted and avoided, who should participate, the rules of interaction, and the purpose of the interactions (pp.47).

Cultural models are influenced by the historical context in which they have been manifested and developed. More importantly in this instance, they are often hidden and unrecognisable to the individual and quite often assumed to be shared by others around them. Cultural settings refer to those activities, which cause people to come together to perform a joint activity. These activities are frequently mundane and played out in the repetitious routines of everyday life, such as the parent who counts the items on a shopping list with the help of a child.

Street, Baker and Tomlin (2001) also sought to understand the social aspect of the uses of numeracy by using theoretical ideas borrowed from literacy research. They have adopted the concepts of numeracy practices and numeracy events to help explore the social characteristics of numeracy. Numeracy practices are understood as the wider social relations of the practice of using numeracy, whereby the practice is influenced by the values, beliefs and arguably, the experiences within the social context. A numeracy event is the occurrence of the use of numeracy that is integral to the lived experience at that time. Although, it does not necessarily follow that the event is visible or explicit to the social actors. Furthermore, shared mathematical knowledge and numerical practices can transcend both contexts as the child makes the transition from school to home and back again (Abreu, Cline & Shamsi, 2002). However, some numeracy practices feature more dominantly in one context than the other. It is not unusual to find that school practices are present at home, however it is less obvious to find home practices in school. This may be because some cultural models conceive that some practices are context specific, in that there are expectations and interpretations

about the kinds of activities that take place in particular communities of practice. The table below depicts how the concepts of cultural models and settings, and numeracy events and practices can be combined to help understand the engagement in mathematical across different communities.

Table. 1 A table showing the numeracy practices that transcend different contexts of the learner

	CULTURAL MODELS		
CULTURAL SETTINGS WHERE THE NUMERACY EVENTS TAKE PLACE		**Schooled numeracy practices**	**Out-of-school numeracy practices**
	School site	Working on number bonds, times tables, fractions	Dates, measuring, Pokemon cards, money, playground games, time
	Home site	Homework, shop bought texts, times tables	Pocket money, laying the table, shopping, setting the video, counting car number plates, counting stairs

The table reveals that cultural models of what counts as school-based or out-of-school numeracy practices can dominate one context or another, which in turn influences the setting where the activity takes place. Notice also that the activities that are most likely to transcend both contexts, like school numeracy in the home site, are the most similar in nature. Shop bought books for example, strongly resembles that which is learnt in school.

The combination of these two theoretical stances of numeracy events and practices, and cultural models and settings provides a robust framework for analysing the engagement in mathematical activities across more than one

community of practice. The latter research framework is particularly relevant to understanding numeracy practices in a multicultural setting because the idea of cultural models and settings addresses a 'shared way of perceiving the world' (Gallimore & Goldenberg, 2001; pp. 47) which includes what is of value and what should be rejected. Tied in with the cultural models notion, is the way the 'shared ways of perceiving the world' has an historical basis to it, influenced by the values that have been carried through time. It may be that some of the parents' perceived ideas about what counts as home numeracy were such a part of their cultural models, that the link between what is an explicit form of mathematics learning, and what is implicit form of mathematics learning becomes stronger.

2.3.3 The negotiation of meaning

The construction of meaning is one of the seminal aspects of this model in relation to this research programme, because, when parents attempt to understand their child's school learning they have to do so with very little first hand experience and information. Meaning is constructed through everyday experience as part of a community of practice, and in order to make sense of the world and our experiences within them we have to negotiate meaning (Wenger, 1998; Duveen & Lloyd, 1993). Meaning is constantly reconstructed depending on the lived experience of that time and is undoubtedly influenced by both history and context. Parents are privy to limited amounts of information about their child's school life and therefore seek other avenues for constructing meaning from an environment from which they are largely excluded. For parents, constructing meaning in relation to their children's education is like fixing together the pieces of a puzzle

and this research will demonstrate that parents use a variety of resources to help them.

It is important to understand that meaning cannot be considered part of an isolated practice. In this research, what needs to be understood is how meaning is constructed through the transitions between two communities of practice, home and school. Furthermore, research using this framework has to date tended to focus on one community, thereby neglecting the process of change as the individual makes the transition across multiple contexts. When Gorgorio, Planas and Vilella (2002) write about meanings, they do so in relation to the transition process for the learner between the classroom and the home. They suggest that the dynamics of the two institutions of home and school are such that meanings are constructed in these learning contexts, which are carried back and forth between the cultural communities the child is engaged in. Added to this complex situation is the multicultural classroom, where the children come from a variety of ethnic backgrounds. Each child brings to the classroom various culturally constructed meanings that have made the transition between home and school. Gorgorio, Planas and Vilella's (2002) definition of transition is an interesting one, they write:

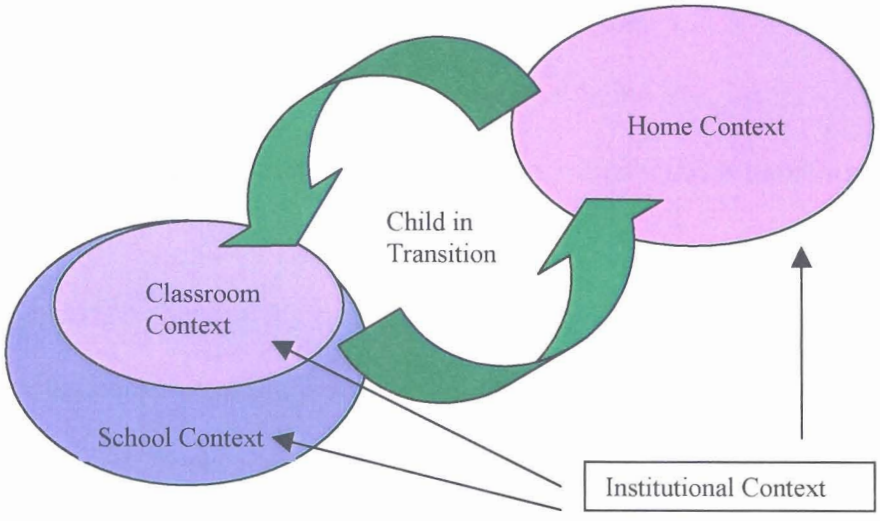
> We understand the construct of 'transition' not as a moment of change but as the experience of changing, of living the discontinuities between the different contexts, and in particular between different school cultures and different mathematics classroom cultures (pp. 24)

Based on this definition, the child in transition needs to be adaptable in reinterpreting new meanings across the different contexts if they are to succeed. As Hedegaard (1999) points out, in a school where there may be a wider bridge between the meanings represented between home and school, conflict may occur. If the culturally mediated meaning systems of home and school are not similar, then the transition for the child between these two institutions may not be smooth.

Beach (1999) refers to transitions as consequential, because not only can they be a struggle, but also they have the potential to alter 'one's sense of self' (pp. 114). In other words, they usually have an impact on the individual and the social context that they inhabit. He also makes the point that transitions come in different forms. The type of transition that a child makes between home and school is called a 'collateral transition' where, historically speaking, activities are taking place simultaneously. The child is in a continuous process of moving between these two major communities of practice and therefore the construction of meaning is ongoing for all the key players of those communities. The fact that the transition between home and school is multidirectional is what, for researchers, makes it so challenging to study. The diagram below (see figure. 3) reveals how the child is engaged in a number of important contexts as they make the transition between home and school. At the micro level, the child is most involved in the contexts of the classroom and home, although the school context will impact on the classroom context. At the macro level, the institutional context has a knock-on effect on all three micro levels. It is possible to see here how the concentric circles notion of context described previously is inadequate in explaining the home-school

relationship, because transitions between multiple contexts is not necessarily precipitated by a particular event, but part of an ongoing social practice.

Fig. 3 A diagram of the contexts of transition between home and school.



A number of authors have sought to understand the bi-directional forms of activity resulting from transitions to different contexts (Ratner, 1999; Beach,1999; Van Oers, 1998). Beach's (1999) discussions of the bi-directional nature of activity are some of the most complex of recent times. Through his writings on consequential transitions as well as more broadly, through his discussions on development, Beach is able to describe how development exists on two levels, the vertical and the horizontal. Vertical notions of development have traditionally dominated psychological research, whereby progress is viewed in a linear/goal-directed fashion (Walkerdine, 1993). This singular notion of progress is particularly problematic in educational settings because development can become hampered

by deterministic and reductionist notions of achievement. Beach (1999) further suggests that relying solely on vertical developmental increases the likelihood that progress will be dominated by the 'controlling interests in that society' (pp. 126). White British citizens mainly dictate the interests of society in Britain, which may be contrary to the educational needs of ethnic minority pupils. Some types of transitions are horizontal, in that they create a new form of representation as a result of individual and social activities coming together. Some kinds of developmental activities do not always lead to progress, in the sense of increasing levels of achievement, but can mediate in the way a representation is transformed.

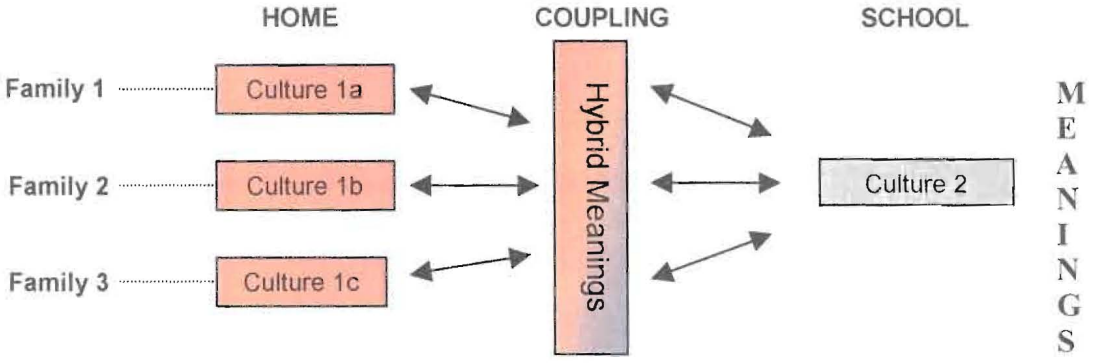
Wenger acknowledges that moving from one community of practice to another can be demanding because certain practices maintain 'boundaries' from one community to another. Some communities seek to deliberately set in place boundaries, which limit their connections with other communities. The home and school situation is particularly complex in light of different types of transition across boundaries because it varies depending on the perspective of the social actors. For the child, the boundaries of the two communities of home and school can be said to overlap, as meaningful representations of learning make the transition from one community to another (see the next section for a detailed discussion on the process behind the negotiation of meaning in more than one community of practice). The boundaries for the teachers and parents are altogether different, in that there is a great deal less physical transition between the communities. The teacher does not physically cross over into the home community at all, although documentation in the form of schools letters, leaflets

and the representations of meaning do transcend boundary practices. In opposition to this, parents are more likely to physically make the transition into the school community (i.e. for parents-teacher consultations or meetings with the teacher) but arguably remain on the periphery of the school community in terms of their child's mathematics learning.

2.3.4 How is meaning negotiated?

Wenger (1998) is right to suggest that meaning is a process, which is shaped and re-shaped by negotiation. What is not clear from Wenger's writing is the form this negotiation takes, particularly in light of the present study. Beach's (1999) concept of coupling provides the means to examine the negotiation of meaning when more than one community of practice is under study. While the child is experiencing two different contexts of home and school there develops a meaning system that utilises aspects of both of these. These aspects may be the construction of new knowledge, identities and representations. Coupling is understood as a unit of analysis for those activities, which cause the individual to move across "space, time and changing social activities" (Beach, 1999; pp.120). The process is one of regular change and transformation, so that children going between home and school find themselves in a situation of constant re-development. However, the model provides enough scope to include that which remains stable (figure. 4).

Fig. 4 Cultural coupling between home and school



This model (figure. 4) outlines the complex couplings that can take place in a multicultural environment. Within one classroom there will be various cultural influences coming from different homes (represented by culture 1a, 1b, 1c). The child at school (represented by culture 2) on the other hand receives the same information and partakes in the same activities as every other child. The meanings the child derives from this information may be quite different but the fact remains that within one classroom, in one part of the lesson the teacher gives the children a common message. In the complex interactions between peers in shared deskwork the children may reinterpret the messages provided by the teacher (see Elbers, 2000, Elbers & de Haan, 2002) and this diagram does not aim to simplify the classroom context. However, the point to be made here, is that if the child is influenced by the meanings derived in the home and school then a hybrid cultural representation of meanings is formed, which indicates coupling. The relative consonance or dissonance for the child may arise from the rejection or acceptance of one culture over another. For some children, culture one and culture two will

have relatively similar meanings, traditions and values because the gap between them is not so large. For others, the transition between the two sites will bridge a greater gap. In some cases, the meaning system of one culture may be so powerful that one culture is rejected and dis-identification begins to occur (Hodges, 1998). Hedegaard (1999) has suggested that the underachievement of some groups suggests school is the most readily rejected culture for some children (see also Gallimore & Goldenberg, 2001).

2.3.5 Meaning developed across histories of societies and individuals

One aspect, however, that is under-researched or even neglected in sociocultural research is the historical. Human activity unfolds and develops as part of histories of individuals and societies. Without considering this dimension in the analysis it is very difficult to explain change. Additionally, it is argued here that meanings can be developed from a time/historical perspective as well, whereby parents' use their own past experiences to form a meaningful representation, which they draw on in an effort to understand their child's learning. This process influences the learning practices that parents engage in with their children at home. In an ethnically diverse classroom there may be a wide variety of past experiences, which parents utilise with their children, which in turn influence the classroom community as a whole. Vygotsky (1978) understood that meanings have already historically evolved when a child is born that will influence the child's subsequent development. Both the settings of home and school have a history to them. Engestrom (1999) suggested various reasons why history has been neglected in empirical research, such as the rigid and deterministic way that socio-historical

development has been presented. The focus on 'internalisation', which was given the status of the key psychological mechanism emphasised by Vygotsky, was mentioned as another reason. However, as Engestrom argued, Vygotsky was also interested in creation and externalisation. He was interested in understanding how new artifacts were created, and how these mediated human psychological functioning (Engestrom, 1999). The concept of internalisation used here has a similar focus to Rogoff's (1995) description of appropriation. The use of the word internalisation is not intended to imply a separation of the individual from their social context, placing an over-reliance on the information processing aspects of internalisation. Rather, a person participating in a community of practice has the potential to appropriate change of the community of practice as much as change within themselves. Focusing on past experiences explores both internalisation as well as externalisation. It enables an exploration of the knowledge and meanings that parents and teachers have internalised from their past histories while at the same time exploring the extent to which they still view these as desirable in the children's education. One might expect that externalisation will emerge in situations where the parents and teachers want to create experiences for their children different from their own.

Acknowledging the rich cultural diversity of the past can be made through using Beach's (1999; 1995a) notion of heterochronicity:

> Heterochronicity refers to the different and partially overlapping histories of societies, technological artifacts, and individuals' lives (...)

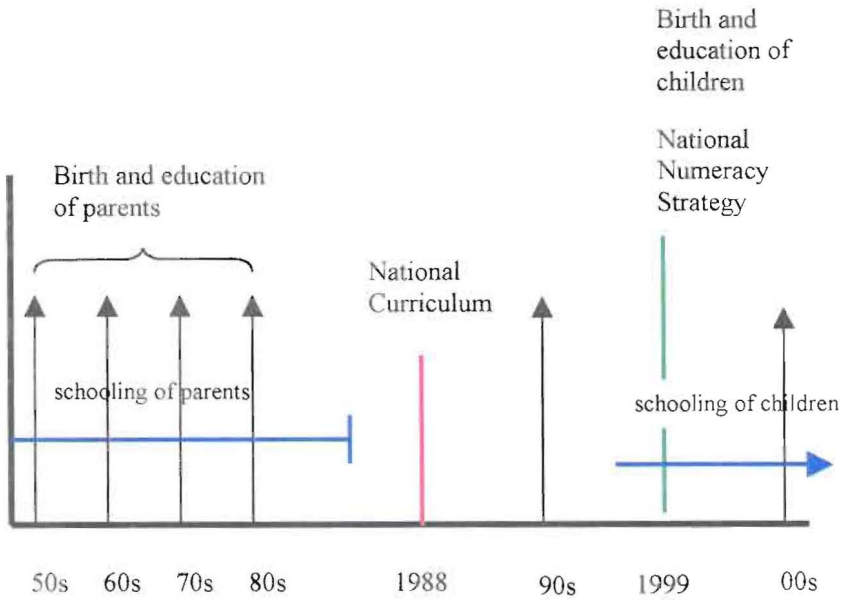
> heterochronicity looks comparatively at the histories and time frames of various activities in a research site as well as the comparative histories and timeframes of particular activities and the lives of different generations in the research population in the interests of identifying periods of rapid societal change (Beach, 1995a; pp. 278 & 277)

The notion of heterochronicity as discussed by Beach (1995a; 1999) has been adopted due to its potential to examine the distinct and partially overlapping histories of the society and the individual. Heterochronicity enables an examination of how meaning is generated on an individual and societal level and is also transitory through time. For instance, when looking at the meanings of interpretation and experience from the past to the present, it is worth understanding the historical significance of school mathematics as a societal activity and the way this can impact on the lives of different individual generations. For the purposes of this research study, the concept has been extended from that which Beach has used in his own research. In a study on high school students becoming shopkeepers and shopkeepers going back to adult learning maths classes in rural Nepal, Beach (1995b, 1999) found that different patterns for learning occurred for each group. Students who were going to become shopkeepers were following the traditional understanding of the leading activity, from school to work. In calculating a mathematics task the students were predominantly using the knowledge gained from school (written methods), while adapting their calculation techniques (object artifacts; using the arm for measuring and calculating) when required. For the shopkeepers who enrolled on mathematics classes a shift was seen between the sole use of object calculation, to the eventual

use of combined written numerals or fingers, as well as object calculation. The concept of heterochronicity for the purpose of the present research study has been extended beyond the cognitive act of forms of mathematical calculations to include changes in representations such as meaning and identity that can occur over time and across different generations.

In the previous chapter the significant changes to educational practice brought about by the introduction of the National Curriculum and the National Numeracy Strategy were discussed. These changes have practical implications when viewed through the concept of heterochronicity. For instance, the changes in school mathematical practices in England after the onset of the National Curriculum and the subsequent National Numeracy Strategy show a distinct change from one generation to another at an institutional level. The representations of school and school practice are potentially very different for those individuals who were part of this practice before or after these changes. Even parents born and raised in the British educational system will have received distinctly different experiences to that of their children. Beach (1999) proposed, in his discussions about heterochronicity, that societal and institutional changes occur more quickly than individual changes. Figure 5. has been adapted by the author from the one used by Beach (1995a) in his Nepali study on shopkeepers, and shows how heterochronicity can be applied to major shifts in educational policy in the UK.

Fig. 5. Heterochronicity of parents' and children's education in the context of changing educational reform



The construct of 'meaning' has been explored in this section in two ways, (i) in the way meaning is negotiated as the child makes the transition between the two communities of practice of home and school and (ii) the way meaning is mediated by the history of a community of practice and changes in time. The next section of this chapter is now going to explore Wenger's understanding of identity, with the addition of other contributions from authors who have enriched our understanding of social identity.

2.3.6 Identity as part of a social practice

When Wenger talks about identity, he does so by looking at 'learning by becoming' in the context of a community of practice (Wenger, 1998, pp. 5). Social identity is not merely a label or a way of seeing ourselves, but a way of interpreting our experiences through participation in a practice, which Wenger

suggests is done through negotiating meaning. Identity through 'learning as becoming' suggests that it is an ongoing and constructive process.

However, there are a number of problems with using Wenger's focus on identity as part of a practice to understand the phenomenon. When Duveen (2001) writes about social identities he acknowledges that identity exists, not just through practice, but also through broader social relationships and symbolic realities. Duveen (2001) describes this process as 'extended identity' because 'others' identification of 'ourselves' precedes our self-identification. Duveen's work with Barbara Lloyd (1993; Lloyd & Duveen, 1992) on gender identities is a vivid example of a form of identity that has already been constructed externally at the time of birth, before the infant is old enough to be engaging in a practice. Succinctly put by Duveen (2001) "identity is as much concerned with the process of being identified as with making identifications" (pp. 257).

Abreu and Cline (2003) have explored the process through which identity is developed, that acknowledges the transition from the extended identities provided by 'others' to the internalisation of that identity. Taking a sociocultural stance they examined three complementary process which are; (i) identifying the other, (ii) being identified and (iii) self-identification. 'Identifying the other' is the process through which the individual comes to gain an understanding of social identities of others that are given by society. 'Being identified' is an amalgam of community and personal identity since it begins with the individual coming to understand identities extended to themselves by others. 'Self-identification' refers

to the internalised and individual level of identity, which ensues after the previous levels have been negotiated in the course of their participation in communities of practice. These three complementary processes provide enough flexibility in the emergence of identity construction for the process to be unique and one of change. They are not fixed, but evolve through the interaction between the person and the social world.

Other authors have also written about social identity, as it first exists externally to the individual before becoming self-internalised. When Dien (2000) writes about the evolving nature of self-identity, she looks to four different levels of understanding, which include the influence of history, society and the individual in the construction of identity. Modified from previous frameworks by Vygotsky and Scribner, Dien proposes four levels of history; (i) the general history of humanity, (ii) the history of individual societies, (iii) the life history of the individual in society and (iv) the history of a particular psychological system (known as self-identity). Most psychological research following the sociocultural tradition will address identity from the levels of three and four. Dien's (2000) paper is particularly novel in the way she portrays her own changing identity in the context of level two, the history of individual societies. Dien is able to show how the history of society, and her place within that changing society had an influence on the construction of her own self-identity. Significant figures in her life, like her parents and teachers, were fundamental in influencing changes in the shared ways of perceiving her world. Furthermore, she pertains to the ways in which developmental age can influence the ease with which self-identity is

transformed when an individual's place in society changes as a result of that historical moment. Dien describes how changes from Japanese rule to Chinese rule in Taiwan were considerably harder for the children who were going through adolescence than their younger counterparts. Dien's construction of self-identity is retold as a life story whereby self-identity is constructed through 'dialoguing with oneself' (pp.15) and bears resemblances to Skinner, Valsiner and Holland's (2001) look at the multi-voiced nature of identity as it is expressed through a narrative. This is a strong way to represent an identity and can be viewed through the way the individual shifts their social position and sustains different identities in different contexts (Ivinson, 1998).

The central theme of any school-based learning is achievement (Oyserman & Markus, 1998), which poses an interesting issue for most of the classes in the present study because they were split by achievement. If achievement is so important to the construction of identity as a mathematics learner, then parents' and teachers' extended identity of their child as a successful mathematician will be important and reflects on the process of 'being identified' and subsequent acceptance of a 'self-identity'. The parent and teacher are frequently in the position of managing social interactions with their child, thereby creating meaning systems. These messages constructed through the meaning systems are likely to be influenced by the parents' and teachers' general conceptions and evaluations of the child's learning (Mugny & Carugati, 1989). School is a context where children are required to develop a certain set of rules about their engagement with other people. School seeks to some extent to coerce and mould the child, the way it

behaves and treats other people. Arguably, children who are most adept at conforming to this 'school identity' make greater progress. Early assertions of this conviction were presented by Bourdieu (1990) in the form of habitus or cultural capital, which are rooted in the social and cultural experiences of the individual. Wenger (1998) adds to this dimension of identity by suggesting that in the link between different communities of practice certain boundaries may have to be overcome. Crossing the boundaries of communities of practice can be delicate and may require negotiation.

As the child gets older, changes class teachers or even schools, parents must redefine the identities they extend to their children in light of the messages received from the child and the schools. A crucial aspect of the complex process of this research addresses the contribution of multiple interactions, not only between the parent and the child (with the child changed by the experience of school) but also parent with school (influencing the ways in which parents interpret and apply the cultural inheritance from their own schooling when engaged in supporting their child's mathematics learning at home). The sources that parents use for understanding their child's school situation entail the negotiation of roles, identities and existing representations of learning. In order to make sense of their child's world, parents' construct their own identities and their children's identities using the past and future self (Cole, 1995; Duveen, 2001). Wenger uses a concept called 'imagination' to describe the kind of process used by parents when they draw on ideas about their child's past and future identity, although Wenger's emphasis is on the individual and their understanding of

themselves. Wenger proposes that imagination "refers to a process of expanding our self by transcending our time and space and creating new images of the world and ourselves" (1998, pp.176). Cole (1995; 1996) proposes a similar conceptualisation of an extended identity in the form of 'prolepsis', which also takes into account the extension of an identity by others. Taking the premise that the child is born into a culturally constructed world, which this thesis does, the concept of prolepsis suggests that the child is not just influenced by the cultural past, but constrained by an imagined future. Prolepsis is "the representation of a future act or development as being presently existing" (Webster's dictionary cited in Cole, 1996, p. 183). Cole argued that this process is manifested in the way parents interact with their children. For him prolepsis is enacted in a sequence, which involves: (i) a recollection of memories from their cultural past, (ii) the use of imagination of the cultural future of their child, and (iii) the present treatment of the child. Therefore, the representation of the past or future is transformed into something concrete in the present. However, studying the construction of cultural identities across time is not just about looking at explicit actions but also shared symbolic meanings (Zittoun, submitted paper) like the use of words, which evoke some identificatory scheme. Carugati and Selleri (1998) propose that parents can alter their representations of their child's learning to fit in with their own social identities and the identity they extend to their child. As Duveen (2001) suggests, the way the parents interact with the child influences the child's own construction of their identity. As they internalise their identity they become increasingly embedded within that community.

Hodges (1998) discusses those times when there are no identificatory feelings of 'learning by becoming' because conflictual moments with the practice cause dis-identification to occur. In a school setting, participation may be compulsory but an identification with the school subject does not necessarily take place. If that is the case then the level of participation, whether it is full or peripheral, must be socially constructed and negotiated as part of the individual's identity. However, the situation is complex because high achieving children do not always identify themselves as gaining a better mastery of the subject than a low achieving child. Moreover, low achieving children do not always identify themselves as such. Other authors describe a similar facet of the rejection of an identity extended to them by others. Duveen (2001) looks at the notion of resistance, whereby "an identity refuses to accept what is proposed by the communicative act, that is, it refuses to accept an attempt at influence" (pp. 269). Resistance is arguably a more appropriate way of speaking about the rejection of an identity than 'dis-identification' because the term 'resistance' implies there is fluidity to the process. It is possible that an individual chooses to resist some aspects of a social identity while adopting other aspects of that extended identity. Deaux (2000) describes how some people come to accept their extended identity because they have little choice in the matter. Resistance implies the possibility of failure to reject an extended identity, thereby leading to conflict.

2.4. Discussion

The rationale for choosing to study parents' and teachers' representations of the child's mathematics learning using the theoretical frameworks of sociocultural

theory and communities of practice are many. Conceptually, Vygotskyian sociocultural theory and Wenger's communities of practice both seek to understand the act of learning within the context of a social practice. This is particularly helpful in the study of multiethnic communities since learning is conceived as being socially situated and influenced by cultural representations. The significant dimensions of the theoretical debate outlined in this chapter have been: (i) the negotiation of meaning, (ii) the importance of the transition process between communities of practice, (iii) the crucial role of the historical at both an individual and societal level, (iv) the powerful impact of identity on the learner and (v) the engagement in activities relating to the practice of mathematics learning. All of these dimensions of the theoretical debate have noteworthy significance in multiethnic education and are best understood as interwoven aspects of the same problem. It has been explained that meaning is negotiated in the social and cultural communities in which one resides, and that this negotiation has the potential to be particularly problematic for children who make the transition between a home and school community that holds very disparate meaning constructions. Every community has a history with pre-existing representations, which contribute to the meanings developed within them. In the homes of many different ethnic minority pupils (and arguably *within* white British homes as well) the cultural construction of knowledge from past experiences may be quite diverse. The meanings, representations and experiences negotiated within communities impacts on identity formation and guides the kind of practice, in form of engagement in activity, that are undertaken.

This chapter lays the foundation by setting out the two theoretical frameworks, which describe the relation between the construction of meaning through present and past experience on the engagement in mathematical practice and the formation of identity. Notwithstanding, the added complexities of studying the social practices within a multicultural setting, as discussed. The methodology outlined in chapter three seeks to convey the means by which the study sought to understand the influence of the key social actors on the child's mathematical learning.

Chapter three: Methodology

3.1. The research questions

The overall aim of the study was to investigate the ways in which parents' and teachers' experiences and representations mediate the child's mathematics learning as they make the transition between home and school to either a multiethnic or mainly white school. In particular, exploring if the forms of mediation they adopt can shed light on the academic success of the child. In order to achieve this overall aim, smaller and more manageable research questions were posed. In the first instance this research sought to investigate what home numeracy practices parents say they engage in at home with their children? How do parents and teachers represent the child's learning of mathematics in home and school? To what extent do parents' and teachers' own past experiences play a mediational role in the child's current school learning? Recognising the influence of the school and home community on a child's learning, the study asks how the teachers' understanding of the influence of parents' culture and practice in their child's home and school learning is influential?

In essence, the aims and objectives of the programme of study have guided the research in two ways; (i) in supporting the data collection and (ii) in guiding the data analysis.

3.2. The research approach

The research was designed to investigate the experiences and representations of parents and teachers in the child's mathematics learning at home and school. The main focus of the study was initially to understand how parents with children in multicultural schools mediate in their child's mathematics learning. However, it soon became clear that in order to understand this element of the study, the whole social context of the child needed to be understood. With an emphasis on the transition between home and school, the parents' representations of their child's learning needed to be understood in a relational way, by also exploring the representations and experiences of the teachers and children regarding the parents input into the child's learning. This research strategy has been employed by Rogoff (1995) among others (Abreu & Cline, 2003; Miller, 1996; Corsaro, 1996) to avoid reducing developmental research to either the individual or the environment. This is methodologically complementary with Wenger's (1998) communities of practice framework, which aims to understand practice at multiple levels of the learner. Furthermore, this multi-perspective analysis (sometimes known as triangulation; see Bauer & Gaskell, 2000) allows for three different viewpoints (the parent's, teacher's and the child's) to be taken into account. All of them have a vested interest in the shared knowledge that is transmitted to and reconstructed by the child, but they clearly could hold different opinions about it. Therefore, in this context the notion of triangulation does not refer to the process of validation, so that the end point is one reality of the phenomenon. Instead, as Silverman (1985; pp.21) suggests, the opinion of each participant 'must be understood in its own terms'. Semi-structured interviews with the key social

actors, classroom observations and a projective identity task were employed to understand the social contexts of the mathematics learner within an ethnographic data collection approach. This chapter will focus on the research process as it occurred chronologically during the data collection. The following table reveals the sequence of events framed within the ethnographic approach.

Table. 2. A sequential description of the research process

Step	Procedure / event duration	Objective
1	Classroom Observations (general)	To obtain basic information on the structure and content of the mathematics lesson. To familiarise the researcher with children in the classroom.
2	Teacher's semi-structured individual interview (60 minutes. Approximately)	To explore biographical details, teachers' views on parental involvement in home learning, homework and mathematics, and to identify a target sample children.
3	Child's individual interview - semi-structured (30 minutes. Approximately)	To collect biographical information, beliefs about homework, mathematics and parental help. To explore the children's representations of achievement in mathematics, as well as relationships between home and school.
4	Parents' interview - semi-structured (60-90 minutes. Approximately)	To explore experiences with own and child's mathematics learning, home/school relationships, home learning.
5	Child identity task[1] (20-30 minutes. Approximately)	To explore the ways in which the child represents the identity of high and low achievers in mathematics.

3.2.1 Choosing the schools

The aim was to find two schools with different ethnic compositions, in order to understand the experiences of the parents, teachers and children within these two different school contexts.

[1] There were occasions when the child identity task was conducted before the parent interview

The schools were sought on the basis that one was mainly multiethnic, reflecting the ethnic diversity of the town and area in which it was situated. Approximately half of the children in the target year groups (year 2; ages 6/7 years old and year 6; ages 10/11 years old) were from a mixture of ethnic minority groups other than white.

The second school was chosen on the basis that it was located in the same town but had a larger proportion (approx. 80%) of pupils who were from white backgrounds. One feature that both school A and school B shared was a desire from the parents to have their children in those schools, because they were both attached to high schools which were highly sought after. As a result of this, a proportion of the children came into the school from outside the local area. An approximate measure of socio-economic status of school populations used in DfES statistics is the free school meals index. The schools in this study had a similar percentage of children eligible for free school meals (between 11% and 14 %). Some data from a large-scale pilot school has also been used in this study. All of the data used from the pilot school were with parents who had children in year 6 (aged 10/11 years old), and their class teacher. The percentage of pupils from ethnic minority pupils in the pilot school was 96%. Out of all the children in the school 88% were from South Asian communities (Pakistani, Indian and Bangladeshi).

School A

School A was comprised of separate infant and junior schools under different head teachers, but situated within the same grounds. The schools were located on

the farther edges of the town in which this study took place. The children ranged from the ages of 3-7 years old in the infant school, on account of there being a nursery attached to the school. The junior school took children from the ages 8-11 years. The school population is described as 'culturally mixed' in an Ofsted[2] inspection report in 1998. The main ethnic groups within the school were White British, Black Caribbean and Black African, Pakistani, Indian, Bangladeshi, Chinese and Mixed heritage. The numbers of children within the schools at that time were 271 (infants school) and 375 (junior school). The children in both schools were put into achievement sets for numeracy. The children studied in this research programme were from the highest and lowest achievement sets. In the infant school there were 90 children in year two (the target year), of these 36% were from ethnic minority groups.

In the junior school there was a total of 86 children in year six (the target year) and 48% were from ethnic minority backgrounds.

School B

School B was located in a different area of the same town. The school had become a primary school under the same headship two years prior to this study. As a result of the previous structure of the school, the infant and the junior buildings were in different areas on the same school grounds, with infant and junior school staff and children spending their day in separate buildings. At the time of the school's most recent Ofsted report in 1998, the number of pupils from ethnic minority

[2] Ofsted is the Office for Standards in Education – a non-ministerial government department whose aims it is to improve the quality and standards of education

backgrounds was 5% (i.e. below the national average). The data on ethnicity from the Ofsted report was used as a criterion for selecting the school. However, it was found that the number of ethnic minority pupils had increased since the report had been published. In the year 2 of school B there was a total of 59 children and 20% of these were from ethnic minority backgrounds. In year 6 of the same school, out of 62 children 14% were from ethnic minority groups. The main ethnic group was White British and other ethnic minority groups within the school included Black African and Caribbean, Pakistani, Indian and Mixed heritage. The total number of children within the school at the time of the study was 450. The children in the infants were not put into sets according achievement for numeracy. The year 6 pupils, on the other hand, were set according to achievement.

The pilot school

The pilot school was located in the same town as school A and B and catered for junior school age children of 7-11 years. There were 240 children within the school and the children chosen for this study came from one of two classes in the year 6 group (10/11 years old).

3.2.2. The ethnography

Within the context of this research, ethnography was not seen as a particular form of data collection, rather it was 'general strategy...in which observation and participation are interwoven with other procedures' (Flick, 1998; pp.146). I sought to understand the social meanings and activities of my research group in their naturally occurring settings. In this instance, ethnography must be used as a means of understanding culture by utilising and constructing particular types of

narrative. Ethnography seeks to understand, not only the occurrence of a practice[3], but the interpretation behind the experience. Like Lloyd and Duveen (1992) and Ivinson (1998) my ethnographic approach was 'motivated' in that there was a decisive focus of study prior to entering the field. It had always been my intention to study the way parents and teachers mediate in the children's learning of mathematics at home and school.

It had been the aim within my research to analyse meaning (or symbolic forms) by linking them closely with the description of concrete experiences provided by participants (Geertz, 1973). This has been enhanced by the use of the 'episodic interview' technique as a methodology for elucidating real life examples (see section 3.2.5 for a description of the episodic interview). Herein lies the basis for the prime use of ethnography, to seek-out what Geertz (1973) describes as 'thick description' (pp. 7; see also Denzin, 1989; Brewer, 2000) and to look for what is meaningful behind the words and actions of the social actors in a scenario. Ethnography, in the context of my research, is principally a vehicle for studying the 'cultural character' of psychological processes (Ratner, 1997; pp.93). Essentially, an ethnographic methodology seeks to understand the cultural meanings that are constructed in order to understand the psychological phenomena underlying it. Quite often, it is the ethnographer's role to uncover the symbolic forms of an act that the participant is not always aware of.

[3] See chapter two for a definition of practice used within the context of this research e.g. practice as distinct from behaviour

Chronologically the first part in the ethnographic process in the current research study were the observations of the 'numeracy hour'[4]. In discussing the observations of the classrooms there arises some issues surrounding the role of researcher in the process. It is this section we turn to next.

3.2.3. The classroom observations and the positioned researcher

The aim of the classroom observations in this research was three-fold: (i) to improve the researcher's general knowledge of classroom practice and in particular the numeracy hour, (ii) to target specific children and study their in-class mathematical practices and (iii) to gain more information which could lend support to understanding data collected through other means, such as interviews. It is these objectives, which guided what information was recorded in the field notes.

The numeracy hour is supposed to be structured in three steps. The first step is the mental/oral calculation step, which is meant to take about five to ten minutes. The children take part in this section of the numeracy hour as a whole class and the aim is to rehearse and develop mental and oral skills. In year 2, the children would sit on a carpet near the teacher's feet at the front of the classroom[5]. Following the oral/mental step of the numeracy hour the teacher would then explain the second phase of the learning, which was the 'main teaching activity' (lasting approximately 30-40 minutes). In those classes where children had sat on the floor

[4] The National Numeracy Strategy officially calls the children's mathematics lessons the 'numeracy hour' and therefore the same has been done here

[5] The year 2 teacher in school B was an exception in that he did not ask the children in his class to sit on the floor for the oral/mental stage of the numeracy hour.

for the mental/oral phase they would then move to designated tables to undertake their work as instructed. The final phase in the numeracy hour is the 'plenary' (approximately 10-15 minutes), which is supposed to round off the lesson. Together with the teacher, the children summarise key facts relating to that days' lesson, rectify any errors and discuss any problems. The National Numeracy Strategy (1999) also suggests that this could be a time when homework can be set, which extends techniques and strategies learnt during the lesson. Teachers varied in how strictly they adhered to the three-step numeracy strategy and all the teachers in the present study mentioned that at times they preferred to be flexible in their approach. Furthermore, the guidelines of the National Numeracy Strategy require the teacher to concentrate on the same topic (e.g. shape and space or solving problems) for one to two weeks before moving onto another topic the following week. It may be that the teacher chooses to focus on different aspects of the topic for a number of consecutive weeks (e.g. shape and space: making shapes, plotting shapes onto grids, translating shapes to other parts of the grid etc...). My observational field notes reflected the structure of the teacher's lessons in that if the children sat on the floor for the mental/oral step then I would place my chair near the children, so that I could watch both them and the teacher. During the 'main teaching activity' I would place myself on one of the tables with the children. On each visit to the classroom I would sit on a different table.

As explained in greater depth in a later part of this chapter, the teacher was asked during their interview to target particular children in the class, based on the child's high or low level of achievement in mathematics. I was able to ask the teacher

more questions about the children based on the time spent conducting the ethnographic knowledge gained in the classroom.

The ethnographic data was also used to lend support to some aspects of the interview data within the context of the analysis. I was able to see how the teachers used the space within the classroom to emphasise issues of achievement (see appendix 8.1 for the classroom layout). For example, in all of the classrooms except one (School B, year 6, high achievers) the children were placed at tables according to achievement. In some instances, each table was given a different level of mathematical work. The observations provided insight into the different levels of flexibility the teachers allowed the children within the numeracy hour. In the pilot classroom, for example, the work was highly directive and the children were led by the teacher's mathematical strategies. At the other end of the spectrum, in school A (year 6, HA) the teacher explored a multitude of the children's mathematical strategies. The differences between the schools revealed through the observations as well as the interviews are discussed in greater depth in chapter seven.

In all the classes except two (school B, year 2 and the pilot school) the children were set by achievement and would sometimes move to a different classroom, and to a teacher that was not necessarily their normal class teacher. The classes that I attended were always the high and low achievement sets for numeracy lessons. As well as being split by achievement between the classes the children were also placed with other children of a similar achievement within the class as well. In

some cases different ability tables were given different work (see appendix 8.1 for a layout of the classrooms).

Apart from fulfilling the objectives discussed above, I saw my position within the classroom as a rapport-building exercise, as well as a means of gaining information (Miller, 1996; Corsaro, 1996). For some of the teachers my presence in the classroom seemed less obtrusive than for other teachers. One teacher in school A (Catherine) particularly benefited from establishing a relationship over a period of time, since our in-class discussions increased in duration and frequency as the time went on.

My intention upon entering the classroom had been to remain a passive observer, enabling me to take written notes with little interruption. However, in some classrooms I was utilised as a classroom assistant and was at times, allocated a table to look after. With hindsight, remaining a passive figure is not an approach I would repeat. The benefits documented by Corsaro (1996) in aligning oneself with the children had an overall advantage in building their confidence. I was able to observe that giving the children time to build a relationship with me was particularly useful with the year 2 children (ages 6/7 years), because their familiarity with me created a more relaxed situation for the interview. For the more gregarious child this process may be of less use, however it becomes an important part of the ethnographic situation when the child is shy.

In the United Kingdom it is standard practice to refer to any authority figures within the classroom by their title (e.g. Mr.) followed by their last name. Prior to starting my observations I had, perhaps naively, considered that I would introduce myself to the children by my first name in order to establish a relationship with the children that was not afforded teacher status (see Corsaro, 1996). However, some of the class teachers disagreed with this decision, suggesting that it would decrease the children's respect for me and encourage bad behaviour. In ethnographic work in the future I would take more time over negotiating this issue with teachers prior to entering the classroom. My discussions with the teachers about this issue always took place once I had entered the classroom, and I felt unable to disagree with the teacher at this point for fear of undermining their authority.

Like Corsaro (1996), I spent a considerable amount of time in the field collecting data. Table 3 provides a summary of the time spent in each school and classroom during the data collection.

Table 3. Table showing the time spent in the schools and the target years' numeracy hour.

School	Time spent in schools	Time spent in classrooms according to lessons per week
Pilot School[6]	May 2001 – December 2001 28 weeks spent in both year groups in total	2 x year 2 (mixed achievers) 2 x year 6 (mixed achievers)
School A	January 2002 – May 2002 20 weeks spent in both year groups in total	2 x year 2 (1 x high achievers) (1 x low achievers) 2 x year 6 (1 x high achievers) (1 x low achievers)
School B	May 2002 – July 2002 12 weeks spent in both year groups in total	2 x year 2 (1 x mixed achievers) 2 x year 6 (1 x high achievers) (1 x low achievers)

Corsaro (1996) explicitly details the advantages of being able to do ethnography longitudinally. One of the aims when doing ethnography with children is to document the productive and reproductive processes in the children's lives. Ideal ethnography documents the key developmental or transitional periods over time, as well as gaining in-depth information of the moment.

My ethnographic observations were instructive in that they gave me insight into the different ways that the teachers utilised the numeracy hour. For example, many of the teachers found it difficult to always strictly adhere to the three-step process proposed for the numeracy hour. Most of the teachers under these circumstances forewent with the plenary at the end of the hour. There was a general consensus among the teacher participants in this study that one hour was

[6] See section 3.3 for more details of the large-scale pilot study undertaken for the research study

not always an adequate period of time for teaching some aspects of the mathematical curriculum.

All the classrooms visited (with the exception of year 2 in school B) shared in common a spatially organised classroom according to levels of achievement (see appendix 8.1 for detailed classroom layouts). This meant that the children often had to move from their regular classrooms to a different location for numeracy. Furthermore, in every classroom in the study, the children were placed at tables with peers who had a similar level of achievement. In some classes each table was set different levels of work and the lower achieving tables tended to be placed closer to the front of the classroom.

It was noted with some interest during the ethnography that the level of day-to-day availability of the teacher to the parents also varied. School B had an 'open door' policy, which meant that the teacher was available to the parents at the beginning and end of everyday. School B called this a 'rolling start' because parents could approach the teacher up to fifteen minutes before the start of the school day. Similarly, the teacher would stand outside in the playground at the end of the day for parental enquiries. The year 2 teachers in school A and the teacher in the pilot school said they were equally available to parents at the end of the school, although there was no formal mechanism put into place for this like there was for school B. I also noticed that Carole (teacher in school A, year 2, high achievers) tended to stay inside her classroom as the children left school at the end of the day, even though she had a door to her classroom which led directly

out into the playground. A number of the parents I interviewed, who had children in her classroom, did not feel she was approachable. Finally, the junior part of school A (year 6) did not allow parents into the playground to collect their children and attempts to see the teacher had to be made by prior appointment. As the analytical chapters progress, there are documented instances where this has become problematic for both the teachers and the parents.

Other differences between the schools have been documented in greater depth in the final chapter. The next step in the research process involved selecting the participants for interviewing. It is this next stage in the process to which we now turn.

3.2.4. Selecting the participants

Two year groups were chosen for this research, they were year two (ages 6/7) and year six (ages 10/11). These two age groups were chosen to explore possible developmental shifts in parental practices and representations of the engagement in home mathematics learning practices at different ages. Furthermore, both of these year groups represent a crucial time for schools, teachers, pupils and possibly parents because they are the SATs (Standard Assessment Test) years. Issues surrounding the exam testing were addressed with parents in their interviews.

Decisions on the selection of parents and children to participate were made through the interview with the class teachers. The teacher was asked to choose

those children who had the highest and lowest achievement levels for mathematics, in order to understand what issues surrounded the gap in the success rate of learning. I wanted to understand why some children did not achieve as well as others; did the home culture and community have any influence over the child's level of achievement in mathematics? If so, what aspects of the home community might contribute to a pupil being either successful or unsuccessful? Teachers were then asked to identify those parents who they perceived as having high or low involvement in the children's learning at home. The purpose for asking teachers to assess the parents according to high or low parental involvement were two-fold, (i) to investigate the extent to which teachers' perceived understanding of parents, who are considered to have high and low levels of involvement in children's mathematics learning, was consonant with parents' accounts and (ii) to help access a sample that might not otherwise be provided by the teacher. In the interview the teachers were given the following grid to help the teacher choose the children and parents to study.

	High Achiever	Low Achiever
High Parental Involvement		
Low Parental Involvement		

The teacher was then encouraged to talk about the children they had targeted in more depth to help me to understand the teachers' representations of why they thought the children were high or low achievers. Also, to explore why they had chosen to classify the parents as high or low involvement and what had informed their decision. In total 22 parents, 8 teachers and 58 children were interviewed for

this research. In addition, a subset of 27 children took part in the child identity task.

The Teacher Profiles

The following table gives a breakdown of the teacher's interviewed as part of the research study, the school at which they taught, their year group and the achievement set they took for numeracy:

Table. 4 Details of the teachers who participated in the present research study

Name	School	Year Group	Achievement Set
Shazia	Pilot school	6	Mixed
Catherine	School A	2	High
Jane	School A	2	Low
Anna	School A	6	High
Mary	School A	6	Low
Richard	School B	2	Mixed
Chris	School B	6	Low
Susan	School B	6	High

All of the teachers were White British with the exception of Shazia, who was from the British Pakistani Kashmiri community and Chris who was White American. An in-depth description of each of the teachers is available in the appendix (see 8.6).

The Parent Profiles

Once the teacher had provided me with a list of names, the parents were contacted via a letter sent home with their children. Those parents who responded were then telephoned and a meeting was arranged. In a small number of instances the

parents did not arrive at the pre-arranged location and could not re-schedule because of other commitments. All of the parents chose to be interviewed at home with the exception of one father, who arranged for me to visit his place of work.

Twenty-two parents in total were interviewed for the purpose of this research, and none of those parents had been through the education system after the onset of the National Curriculum and the National Numeracy Strategy. Eleven of the twenty-two parents were from ethnic minority backgrounds and out of those eleven; three had been educated in countries other than the United Kingdom. The remaining participants were White and British born. The following table is a breakdown of the ethnicity of their children whose parents were interviewed for the study:

Table. 5 A description of the ethnic background of the children whose parents were interviewed.

	Parents Born and Educated in the UK	**Parents Born and Educated outside the UK**
Ethnic Minority Children	1 Bangladesh	1Black African
	3 Indian	1Indian
	3 Mixed Heritage (Black Caribbean/White British; Black African/White British and Chinese/White British)	1 White European
	1 Pakistani	
White British Children	11 White British	

Each of the parents that were interviewed have an in-depth profile in the appendix (see appendix 8.7).

The child profiles

Once the teacher had given me the names of the target children, the parents were contacted and consent for the child interviews were confirmed. Following consent the interview process with the children began. All of the children were interviewed before their parents and this allowed me to go to the parent interview with some knowledge of the child.

The subset of children interviewed for the identity task were chosen on the basis that (i) their parents had already agreed or had been interviewed and (ii) the children had been considered competent or confident enough in the interview to take part in the story task.

The following table is a comprehensive breakdown of the children interviewed for the study. The table details the achievement level of their child, the level of involvement provided by the teacher, and the participation of the parent and child in the various aspects of the study. All of the children's interview data was used in the analysis of the data.

Table. 6 A comprehensive description of the parents and children interviewed for this study

School	Year Group	Teacher	Name of child	Ethnicity	Achievement	Parent involvement	Parent interview	Child interview	Child identity task
School A	2	Catherine	Michael	White British	high	high	✔	✔	✔
School A	2	Catherine	James	White British	high	low	✔	✔	✔
School A	2	Catherine	Jamal	Bangladeshi	high	high	✔	✔	✔
School A	2	Catherine	Dima	White British/ Chinese	high	high	✔	✔	✔
School A	2	Jane	Rajesh	Indian	low	low	✔	✔	✔
School A	6	Michelle	Dale	White British	low	low	✔	✔	✔
School A	6	Michelle	Amira	Pakistani	low	high	✔	✔	✔
School A	6	Anna	Monifa	Black African	high	high	✔	✔	✔
School A	6	Anna	Louise	White British	high	low	✔	✔	x
School B	2	Richard	Amy	White British	low	low	✔	✔	✔
School B	2	Richard	Jennifer	White British	high	high	✔	✔	✔
School B	2	Richard	Simon	White British	high	high	✔	✔	x
School B	2	Keith	Samuel	White British/Black Caribbean	high	high	✔	✔	✔

School B	6	Susan	Jack	White British	high	high	✔	✔	x
School B	6	Chris	Lee	White British	low	middle	✔	✔	x
School B	6	Chris	Natasha	White British	low	middle	✔	✔	x
School B	6	Susan	Sumana	Indian	high	high	✔	✔	✔
School B	6	Susan	Adam	White British/Black African	low	low	✔	✔	✔
School B	6	Susan	Anthony	White British	high	high	✔	✔	✔
Pilot School	6	Shazia	Nimrat	Indian	high	high	✔	✔	x
Pilot School	6	Shazia	Elena	White European	low	high	✔	✔	x
Pilot School	6	Shazia	Fazain	Pakistani	low	low	✔	✔	x
School A	2	Jane	Josie	White British	low	high	x	✔	x
School A	2	Jane	Bethany	White British	low	low	x	✔	x
School A	2	Jane	Nikki	Chinese	low	high	x	✔	x
School A	2	Jane	Mitul	Indian	low	high	x	✔	✔
School A	2	Jane	Sanya	Pakistani	high	low	x	✔	✔
School A	2	Jane	Beth	White British	Low	low	x	✔	x
School A	2	Jane	Saeeda	Pakistani	Low	low	x	✔	✔
School A	2	Catherine	Nicole	White British	high	high	x	✔	x

School A	2	Catherine	Adrian	White British	high	high	x	✔	x
School A	2	Catherine	Usmaan	Pakistani	high	high	x	✔	x
School A	2	Catherine	Vanessa	Chinese	high	high	x	✔	x
School A	6	Mary	John	White British	low	high	x	✔	✔
School A	6	Mary	Brandon	White British	low	low	x	✔	x
School A	6	Mary	Kurtis	Black Caribbean	low	low	x	✔	x
School A	6	Anna	Chiranjiv	Indian	high	high	x	✔	✔
School A	6	Anna	Sophie	White British	high	high	x	✔	x
School A	6	Anna	Victoria	White British	high	high	x	✔	X
School A	6	Anna	Sherrise	Black Caribbean	high	high	x	✔	✔
School A	6	Anna	Ranika	White European	high	high	x	✔	x
School A	6	Anna	Ryan	White British	high	high	x	✔	x
School A	6	Mary	Sandra	Black African	low	low	x	✔	x
School B	6	Susan	Olivia	White British	high	high	x	✔	✔
School B	6	Chris	Domonic	White British/Black Caribbean	low	low	x	✔	✔
School B	6	Susan	Louise	White British	high	high	x	✔	x
School B	6	Susan	Luqman	Pakistani	high	high	x	✔	x

School B	6	Susan	Jaden	White British/ Pakistani	high	high	x	✔	✔
School B	6	Susan	Caroline	White British	low	low	x	✔	x
School B	6	Susan	Chris	White British	low	high	x	✔	x
School B	6	Susan	Mediha	Pakistani	low	high	x	✔	✔
School B	6	Susan	David	White British	low	low	x	✔	✔
School B	6	Susan	Lewis	White British	high	low	x	✔	x
School B	2	Richard	Steven	White British	high	high	x	✔	✔
School B	2	Richard	Mark	White British	high	low	x	✔	x
School B	2	Richard	Melissa	White British	low	high	x	✔	✔
School B	2	Richard	Adam	White British	low	high	x	✔	x
School B	2	Richard	Molly	White British	low	high	x	✔	x

3.2.5. The interviews

Teachers, parents and children were interviewed using the same technique, known as the 'episodic interview' (Flick, 1998; 2000). The episodic interview was appropriate for this research programme because it is, according to Flick, a method for studying everyday knowledge. The method relies on the fact that members of a group share some common knowledge about the subject under study. In this project for instance, the parents, in spite of their diverse past histories, had their children in the same schools and were expected to share some understanding about their child's mathematics learning and therefore share some knowledge about this subject. However, the interpretation, experiences, values and practices under study could be quite diverse. Similarly, the ways in which this knowledge may be utilised could be very varied. Equally, the teachers had their own unique childhood and previous teaching experiences but all had the job of teaching the children the mathematics curriculum. Finally, the children shared knowledge of mathematics learning in their home and school communities with their parents and teachers respectively. In the case of the children however, the home community provided the potential for a varied understanding about mathematics learning. The varied backgrounds of the children was a relevant dimension on the construction of their mathematics classroom as a culturally diverse community.

The episodic interview is distinct from other interview techniques in that it develops links between subjective definitions of topic concepts, and the concrete examples of situations for the participant. The episodic interview actually invites

the participant to give examples of relevant instances they have had in the past and their opinions about the subject matter. The episodic interview question is therefore set out in two parts, the first part asking for an opinion about the topic (i.e. Has your school experience affected the way you approach learning with your own child?) and the second part of the question invites the concrete response (i.e. Could you give me some examples?). In this way the episodic interview is able to tap into those most salient experiences[7].

The interview was semi-structured in that I was able to ask more probing questions that were not part of the interview schedule. The interviews with parents and teachers lasted between one and two hours, and the child interviews tended to last between thirty and forty minutes. I will now discuss the interviews in more depth

The teacher interview

After a number of weeks of classroom observation the class teacher was interviewed. The teacher was the first person approached for interview because they helped me choose which children to study and which parents to approach. The questions were created using previous research, the aims and objectives of the programme and of study and the theoretical underpinning as a guide. The teacher interview worked on two levels: (i) firstly, it aimed to understand teacher's representations of parental involvement in children's mathematics learning in a way that linked with the issues that were to be discussed with parents in their

[7] Please refer to the appendix for a full description of the interview questions

interview; (ii) secondly, the teacher was used to select the parent sample on the basis of the criteria that were discussed above under 'selecting the participants'. The interview themes for the teachers were as follows:

(i) Teachers' representations of parental involvement in the children's school learning

The teachers were asked to explore broadly the relationship between home and school from two perspectives: (i) a personal perspective and (ii) the perspective of the school. The teachers were also asked whether they considered the ethnic make-up of the school had an impact on the home-school relationship and in what ways.

(ii) Teachers' views of mathematics homework

The questions in this section were more closely refined towards mathematics learning at home. The types of homework the teachers preferred the children to engage in and the teachers' representations of the type of home learning they wanted parents to engage in.

(iii) Teachers' understandings of children's mathematics learning in relation to their home background

In this section the impact of parental involvement in home mathematics was explored. As well as teachers' representations about what kind of mathematics they think is learnt in the home.

(iv) Teachers' representations of the children in the class based on achievement and parental involvement

Section four was used to select the participants for the study according to levels of achievement and the teachers' understanding of the levels of parental involvement at home. The interviewer probed the teachers' representations of the child and parent in four ways: (i) directly in academic work, (ii) the home as a learning environment for mathematics, (iii) the parents general involvement in the child's school life and (iv) the level of emotional involvement of the parents in the child's education. These four levels of exploration were developed following the pilot study because it soon became apparent that the teacher felt particularly uncomfortable describing parents who they would classify as low parental involvement in terms of academic involvement only.

(v) Teachers' own experiences of their individual learning and teaching of mathematics.

The final section of the interview explored the teachers' own experiences as they related to mathematics. This included working as a teacher, being a pupil

themselves and their experiences of being a teacher and a parent (for those interviewed who were parents).

The parent interview

Like the teacher interview, the themes for the parental interview were devised using the theoretical backdrop, previous research and a wish to research in greater depths some of the aspects touched upon in previous studies of this kind. The three major themes of the interview were:

(i) Parental representations and educational practices at home

This section initially covered a broad subject matter, which included questions about the parents' notion of education. Then it focused on understanding practices related to mathematics homework, home learning that involves mathematics and the Standard Assessment Tests[8] (SATs). In essence, the first theme of the parental interview was intended to access information about homework practices as well as parents' representations about mathematics homework and educational activities at home. The thesis focused on parents' contribution to homework, and not that of other significant persons because at the beginning of the research journey the focus was going to be on parental involvement. This later evolved, through the interview process with parents into a study of the whole educational context of the child. Moreover, although the homework help of other significant family members

[8] Standard Assessment Tests are the statutory examinations children in year 2 and year 6 are required to take by the government.

is important, restrictions on access to interviewees limited this element of the study of home learning

(ii) Understanding parents' own past educational experiences and the exploration of the influence of the past on the child's current school learning.

The questions relating to past experiences explored the participants' representations about their own formal education, their general experiences of school and their learning of subjects, and moving on to mathematics in particular. More importantly, the questions then explored how these experiences influenced their representations and practices of the child's current school learning. The second theme has its basis in sociocultural theory and explores the idea that parents' past experiences impact on their child's current learning. Therefore, the aim of this interview section was to explore parents' experiences in education and with mathematics specifically, to see if it could help tease out information about the present mathematical practices of the home and representations of learning.

(iii) Parental representations of their child's school and their levels of involvement in school activities.

This last section explored parental representations of the home-school relationship and in particular, parental representations about activities within the school. This

section also explored specific instances where information was exchanged between the parent and the teacher. These exchanges of information ranged from informal meetings to parents/teacher consultations, discussions about the written report, the viewing of the children's schoolwork and partaking in school events such as sports days, as well as experiences of working in school.

While the emphasis in the questioning was clearly on mathematics it is worth noting that the parents frequently used the interview opportunity to engage in discussions about the educational world of their child in general. This is reflected in the analysis of the parental data in later chapters.

The child interview

As with the other interviews, the episodic technique was used for the children. However, the questions were formed in a way that sought to make them succinct and less complex, as some of the children in the study were as young as six years of age. The themes covered with the children break down as follows:

(i) General feelings about school education

The first section followed a line of questioning about school (e.g. do you like it?) and subjects (e.g. what is your favourite subject?). This section helped to establish the children's feelings about school as well as particular subjects. The children were also asked a generic question about their opinion on homework (see appendix 8.4) and were asked to describe their school day.

(ii) Maths in particular

The second theme went more deeply into mathematics in particular, by exploring feelings about mathematics, homework and maths in everyday life (e.g. How do you think that maths can help you in everyday life? Could you describe ways that it could?). This enabled me to gain a deeper understanding of the children's own feelings about mathematics, especially in relation to their representations of achievement in the subject.

(iii) Child and parents

In the section on 'child and parents' the child was invited to talk about mathematics homework and key people who might help with mathematics at home (e.g. Does anyone in your family help you with your maths homework? Can you tell me about that?). This section strove to gain a deeper insight into the children's representations of the home learning environment as it related to mathematics. There was a focus in this section on understanding the ways in which the children understood their parents' involvement in their home mathematics learning.

(iv) Child's life outside of school

Finally, a short section was devoted to the child's out of school activities, to help understand the way in which these activities might help the child explore mathematics in everyday contexts (e.g. Do you play any games at home that have anything to do with numbers? Can you describe them for me?).

3.2.6. The child identity task

The child identity task was a story completion technique, which uses a projective testing to understand the inner world of the individual. The participant is asked to produce a story, which contains specific prompts provided by the interviewer on the topic in question. The story completion technique was developed from sentence completion tests, whereby participants are prompted with the beginning of a sentence and asked to complete the rest (Hart, 1986). The story completion task used in the current research programme was adapted from a similar task used by Cline et al. (2002; Cline et al. 1998)[9].

The task was inspired by the theoretical discussion presented in Lloyd and Duveen's (1992) work on gender identities. Lloyd and Duveen (1992) suggested that certain patterns of identification occur in accordance with dominant representations of understanding, which are then internalised into ones self-identity. For instance, some individuals will identify with the dominant representations while some individuals will resist the identity placed upon them

[9] See appendix 8.5 for the full story script

by their communities or society at large. In the present research the mathematical identity of the learner is explored through examining the projected characters of high and low achievers. The aim of the child identity task was to explore the ways in which children represent the identity of a high or low achiever in mathematics.

The child identity story

The story is about two boys/girls who belong to the same school which the children interviewed as part of this research attend. One of the boys/girls is high achieving and the other low achieving[10]. The story always began with the high achieving child and was subsequently followed by the story for the low achieving child. There were six category prompts for the story and they were:

(i) The characters general feelings about school

(ii) Feeling bad about something at school

(iii) Self and other identification with achievement in maths

(iv) Exploration of characters family

(v) Characters' feelings about home life

(vi) The characters' mathematics homework

Following the completion of the stories, the child was asked a number of general questions about the similarities between the interviewee and the children in the story, to allow the researcher to make comparisons between the identities of the child in the story and the identities expressed by the participant.

[10] The name of the boy/girl in the story was ethnically/religiously similar to the child who was taking part in the task.

Using a visual representation

Like Lloyd and Duveen (1992) a visual representation of school was used with the year 2 children (ages 6/7 years) in order to aid them with the task. The model was not used with the year 6 children because it was felt the children were old enough to maintain a memory of each character without the aid of a visual model. A 3D model (see figure. 6) of a classroom with two featureless figures sitting at desks, were used to represent the children in the story. At the beginning of the story I would point to one figure to represent the boy/girl who was good at maths and to another figure to represent the boy/girl who was not good at maths.

Fig. 6. A model of a school classroom used with the year 2 children to aid their visual representation.

3.3. The pilot study

The research approach described above was tested in a large-scale pilot study involving two teachers, eight parents and their children in another school in the same town. A number of changes were made to all the interview schedules following this study. Some of the interview questions were excluded because other questions covered the topic adequately and extra questions were added to enhance the original schedule and cover important topics/questions more fully. One of the pilot teacher interviews produced an interesting vignette, which teachers in the main study were asked to read and comment upon. The findings in the pilot study also gave rise to the child identity task because it became clear that many of the children interviewed held strong representations about achievement in school and these needed to be explored. Furthermore, the teacher interview with Shazia was the only interview with a teacher who was not white and so her interview has been included in the main analysis, along with three of her pupils and their parents. The data collected in the pilot study has been presented at a number of conferences (O'Toole, 2002a; 2002b; O'Toole & Abreu, 2003a; 2003b).

3.4. Ethical considerations

Ethical issues are always extremely important, particularly when the research is conducted with children. Parental consent for the researcher's presence during the numeracy hour and for the child interview was sought prior to going into the field. Informed consent was sought from the children themselves before starting the interview. The British Psychological Society Guidelines on ethical principles for

gaining consent from children were followed. All the interviews were confidential. Furthermore, supervisory advice was sought on all ethical issues relating to the children, as suggested by Lindsay (2000). The same consent and level of confidentiality was sought and discussed with the parents and teachers, and assurances were given about the level of confidentiality with which data from the research programme would be treated. All the names used within the report are pseudonyms.

3.5. Methods of analysis

The procedure for analysing the interviews was borrowed from Flick (1998) as it was considered a natural progression between Flick's (2000) episodic interview to the complementary strategy of thematic coding that he developed. After full-transcription of the interview the analytical process involved (i) reading and interrogating the text in relation to the main research questions, (ii) subsequently refining the analysis to focus on different themes and coding the data with the support of the Atlas-ti qualitative analysis software; (iii) examining the data for similarities and variability between participants with different experiences. The codes were established according to the main theoretical components of Wenger's (1998) communities of practice framework, meaning, practice and identity. Codes were also attached to parts of the discourse relating to past experiences. For the construct of meaning a secondary level of coding was developed which linked the meaning construct provided with the source from which this information appeared to be represented. This multi-level coding is described in more detail in chapter four.

The thematic analysis

The in-depth analysis took place using the qualitative data analysis package, Atlas.ti, as a tool for conducting a thematic examination of the data. The technique allows the interviews to be coded according to a pre-existing theoretical framework. Flick (1998) developed and reformulated a form of analysis that was developed by Strauss and Corbin (1990; Strauss, 1987) known as Grounded Theory or theoretical coding. This quotation from Flick (1998) helps to understand what coding is supposed to do:

"...coding includes the constant comparison of phenomena, cases, concepts and so on and the formulation of the questions which are addressed to the text. Starting from the data, the process of coding leads to the development of theories through a process of abstraction" (pp.179)

Flick (1998; 2000) advises that the theoretical basis for the study and the research questions should be established before the analysis begins. In my research the questions were asked prior to the analysis, however, a reciprocal relationship between the research questions and the coding took place as an ongoing process. Moreover, the interviews were analysed separately and then crosschecked at a later date, the premise being that although the interview centres on the same topic, the social worlds of the interviewee's may be very different. While trying to define the topics, it is advantageous if the views related to them can be kept open.

Upon Flick's (1998) recommendation a short case study description from each of the parent and teacher interviews was prepared prior to the in-depth coding

analysis. These can be modified throughout with more in-depth analysis. The case study description has some of the basic descriptive information about the interviewee and any initial insights into the research topic under cover. (see appendix 8.6 and 8.7).

3.6. Thematic analysis situated in the theoretical framework

The themed analysis was conducted according to the broad areas reflected in the framework presented by Wenger's communities of practice and Vygotskian sociocultural theory. Chapter four is devoted to the construction of meaning as it is represented in the parent, teacher and child's interviews. Issues of identity are explored through the interview data and the child identity task in chapter five. Representations of practice in the form of engagement in mathematical activity and representations of past experiences are analysed in chapter six. The notion of community is represented within all three chapters when the data warrants looking at the community plane with a greater focus (Rogoff, 1995). While it had always been my intention to study the wider social context of the child as a learning of mathematics by looking in both the communities of home and school, the tendency by the participants to deviate from the focus on mathematics learning was a surprise. The analytical chapters outlined above reflect that the participants often saw mathematics as only one dimension of the child's educational world and felt compelled to talk about the whole context of the child's learning and development. The consequence is a complex web of relationships where views of a child's mathematical learning are intricately connected with wider representations such as child development.

The presentation of findings in the analytical chapters has been conducted in two ways. The chapter on meaning and representations of practice has used the thematic examination of the interviews as the main organiser. The identity chapter, however, predominantly uses a case study approach. The main reason for these two types of presentation is type of data obtained in relation to each broad area. After the initial thematic analysis it was clear that the analysis of identity would benefit from a case study approach. Perhaps most importantly, the child case study reported is particularly special because the child was able to clearly articulate issues of culture in relation to her home and school mathematics. A similar point can be made about the teacher case study used in the chapter, since Shazia was the only ethnic minority teacher interviewed as part of the study and therefore proffered a rich insight into multiethnic education. Since applied developmental research in multiethnic classrooms is a fairly new area, as is the understanding of multiethnic identity in such settings, I opted for the forms of presentation, which provided deeper insights into the phenomenon.

Chapter seven brings together the findings of the previous three chapters and then uses the empirical work to move the theoretical framework forward. A model for the child's experiences of transition between the communities of practice of home and school, taking into account the complex meanings, identities, and representations of practice is proposed.

Chapter four: The meaning constructs evoked by parents, teachers and children to understand the educational world of the child

4.1. Introduction: analysing meaning constructs

In the theoretical discussions it was proposed that understanding the educational world of the child is like fixing together the pieces of a puzzle. This simile has been very useful in organising the analysis on meaning constructs evoked by the key figures, including the child, to understanding the position of the other. Examining the meaning constructs evoked by the key figures in the educational world of the child addresses an aspect of the theoretical concept of meaning as it arises through the participation in a community of practice. In chapter one questions were raised about how shared meanings, experiences and representations exist between the two different learning communities of home and school. The aim of this chapter is to investigate those meaning constructs, which dominated the interviews with the parents, teachers and children interviewed as part of this research. The chapter is divided into three main parts, each focused on one of the major meaning constructs. Revealed in the analysis are representations of achievement, homework and education, which in the context of the current chapter are viewed as symbolic.

In chapter three it was proposed that Flick's (1998) thematic analysis was a useful means of interpreting the data in this research. The dominant themes, which emanated from the interviews have been called meaning constructs because they

depict the way the participants make sense of the world and their experiences. The analysis of the construction of meaning in the context of the parent, teacher and child interviews was conducted in two steps. The first step addressed what key dimensions the participants evoke to construct meaning of the educational world. The second step addressed what sources were utilised for constructing these meanings. During the interview the participants were asked to comment upon, (i) their notion of education, (ii) their notions of achievement, and (iii) their representations about homework. Within the context of these interview topics the participants cited a number of different 'sources' they used to try to understand these aspects of the child's learning. Not surprisingly, some of the 'sources' transcend more than one construct, others were more specific to one kind of construct. The tables below reveals the three meaning constructs described in this chapter and their relevant sources:

Table 7. The participants' meaning constructs and their sources of information

	Meaning Constructs		
Source Unit	Achievement	Homework	Education
Child	✔	✔	✔
Representations of child development	✔	✔	✔
Exam results	✔		
Homework	✔		
Job role	✔		✔
Parents/friends	✔		
Schoolbooks	✔		
Siblings	✔		
Teacher	✔		
Government information			✔
Representations of a projected future			✔
Parent guides			✔
Own experience[1]	✔	✔	✔
Representations of parents	✔		
Biological functioning versus environmental factors	✔		
Purpose of homework		✔	
Amount of homework		✔	
Representations of parental involvement in homework		✔	

It is interesting to note that the sources that parents used to construct meaning came in two forms, the first being something physical or concrete like exam results or schoolbooks and the second being symbolic representations, like child development or projected futures.

[1] Any issues raised as part of participants 'own experiences' will be explored in chapter 6

The meaning constructs that the teachers and children evoked frequently echoed those of the parents. To maintain analytical consistency it is the shared parents, teacher and child constructs that have been reported here. There were some slight differences between the parent, teacher and child discourses. For example, the teacher discourse tended to be more categorical in its delivery. In some instances the teachers used the representations of their own past experiences as an indicator of their current opinion about a meaning construct and these will be discussed in chapter six. The children's discourse was, on the whole, more simplistic in its delivery because of the ages of the children used in the study.

4.2. Representations of achievement

Even though parents, teachers and children were asked specific interview questions surrounding achievement, as a meaning construct the notion of achievement was consistently evoked by the participants throughout many aspects of the interview. The fact that the participants regularly discussed how they constructed achievement without being prompted indicates how meaningful such a construct is in research surrounding school and learning.

4.2.1. Parents' construction of achievement

For many of the parents (and teachers), issues surrounding achievement were accentuated by the SATs (Standard Assessment Tests) examinations, which take place in year 2 and year 6 (the target years). Whether achievement talk would dominate teacher and parent narratives so much in other, less crucial year groups would require further research. In their narratives, parents utilised a varied number

of sources to help them construct their understanding of 'achievement'. The following table reveals the sources parents used to try and understand their child's achievement and included is the number times they drew on that particular source during the interview. The data is collated according to age, gender, school, the child's school performance and ethnicity.

Table 8. Distribution of the sources used by parents to understand achievement by biographical details

Evoked source units	Teacher	Child	Exam results	Child Development	Parents/friends	Job role	Schoolbooks	Homework
Age:								
6/7 years	15	5	7	9	2	2	3	5
10/11 years	15	7	11	13	1	1	4	6
Gender:								
Male	18	6	11	13	3	2	3	7
Female	12	6	7	9	0	1	4	4
School:								
Pilot	3	1	2	3	0	0	1	0
School A	14	6	7	9	2	1	3	6
School B	13	5	9	10	1	2	3	5
School Performance:								
LA	11	4	7	9	1	1	2	5
HA	19	8	11	13	2	2	5	6
Ethnicity:								
White British	17	7	9	11	2	3	3	7
Non white British	13	5	9	11	1	0	3	4

Source: teacher

It is possible to see from the table above that the teacher was the greatest source of information about achievement for the parents in the current study. On the whole parents' communication with teachers tended to centre around the parent-teacher consultation on a twice-yearly basis. Communication between parents and teachers surrounding achievement is complex, and teachers couch many of their descriptions of the child to parents using 'teacher talk'. The form of language that teachers use, which I have described as 'teacher talk', demonstrated how a particular description could connote two different meanings. For example, if a child is described as having 'leadership qualities' this can also be interpreted as 'the child is bossy'. The following two quotes are from teachers in the sample who were also parents and provides the case in point. Jane and Susan spoke about their own experiences when attending parent-teacher consultations and the insight this provided into 'teacher talk'. Jane told me:

Jane: They can't pull the wool over your eyes once you work in education. If you go for a parents evening they don't give you the woolly airy fairy; they don't give you the estate agents talk, they give you 'Alex is not doing well at this or yes he's doing well at that' they don't pull the wool over your eyes.

Sarah: So teachers are a bit more straight with you?

Jane: Yeah, they don't, they don't pull the wool over you. They talk to you because you know the terminology and everything. It's not like, when I write reports we have to write 'if concentration was higher he would do

better' you know [meaning] 'if so-and-so applied themselves', in other words 'if so-and-so didn't behave like an absolute little shit'.

(Teacher: school A, year 2, LA)[2]

Susan reported a similar episode with her own daughter:

Susan: When Vicky was tiny, her first parents evening, she had a lovely guy, bloke teaching in key stage one which is quite unusual, really nice guy. And he was chatting away at her and he was saying 'she's extremely well organised, she loves to get things up and running and organise other children and I looked at him and said 'so you mean she's bossy' and he said 'oh God, I forgot you were a teacher' because there was your teacher speak, lets couch 'bossy' in nice terminology. And I think you do, do that, you read a report and think, right, I know exactly what they're saying there

(Teacher: school B, year 6, HA)

'Teacher talk' can produce a discrepancy between the teacher's discussion of the child's achievement and the parent's awareness of their child's achievement. Parents who do not undertake educational roles within schools may not be aware of the hidden messages in the narratives of 'teacher talk'. Nor are there any feasible reasons why parents should suspect that the teacher's language holds a

[2] The abbreviations of LA and HA will be used throughout the analysis to represent low and high achievement.

hidden agenda. Moreover, there was inconsonance between the information some of the parents and teachers provided to me in the interviews about the children. For instance, Rajesh's mother (Indian mother: school A, year 2, LA) asked the teacher in the parents consultation, 'how's he getting on, will he be alright?' and Rajesh's mother recalled that she said:

> Rajesh's mother: 'he'll be fine, no point to worry or anything...if he just carries on the way he's doing he's fine'

However, the teacher described Rajesh to me as a low achieving child and his family were categorised as low parental involvement. Another parent, Fazain's mother, reported a similar conversation she had with a teacher at her son's school:

> Fazain's mother: Mr. Headworth, he was saying that he is really good in maths because he comes home and you know, because I improve my maths, you know, a lot. So I teach him, and he's coming really good, he's top in his class
>
> (Pakistani mother: pilot school, year 6, LA)

Fazain was by no means top of his class and was described to me by his classroom teacher (Shazia) as a low achieving child. Incidentally, Mr. Headworth was not his classroom or mathematics teacher, which further increased the levels of discrepancies. Clearly though, this parent was willing to accept his authority about her son's success in mathematics in school. Mr. Headworth took the other year 6 class (there were two year 6 classes in that year) for lessons and was also the

Deputy Head Teacher of the school, which may have influenced the parent's decision to accept his judgement so readily.

Michael's mother (White British: school A, year 2, HA) described a negative parent-teacher consultation she had experienced. In his first two years schooling, Michael's parents had always been told that he was achieving well. At the most recent parent-teacher consultation, Michael's parents were surprised to be told that he was not doing as well as the others, particularly in reading. This change in the representation of her son's achievement held by the teacher prompted Michael's mother to questions the teacher's judgement:

> Michael's mother: As I say, this consultation with Mrs. Edwards didn't even sound like Michael...I thought, she doesn't know this child at all, doesn't even sound like him...and I remember being so cross...and I said to [the head teacher] 'what does this child have to do to get any praise?' because I thought it was so unfair. Because he was working hard and yet there wasn't a single thing said that was positive.

There is obvious dissonance here between the child's actual achievement, which is high, and the information supplied by the classroom teacher (incidentally, Michael had a different teacher, Catherine, for mathematics. The information she supplied about his mathematics learning was that he was a high achiever). This is important, since the teacher was a major source of information for all the parents as a means of understanding their child's achievement. Michael's mother may have been confident enough in her judgement of her son's achievement to

challenge the teacher's negative report because of all the positive feedback other teachers had provided her in the past.

On the whole, parents placed a great deal of emphasis and importance on the teacher's judgement of their child's achievement without always realising that teachers' discourse can be framed to connote multiple meanings. One might speculate that these discrepancies are even more problematic for the ethnic minority parent, like the mothers' of Rajesh and Fazain, who may have been socialised to understand a more literal educational discourse. Furthermore, any parent would need to have confidence in their appraisal of their own child's achievement to challenge the teacher.

Source: child

The potential fallibility of parents ability to interpret the teacher's descriptions of the child's achievement and the infrequent meetings with the school to discuss achievement, led some of these parents to find other means of understanding their child's mathematics progress on a day-to-day or week-by-week basis. Instead, some of the parents used the child as an indicator of progress. Signs of contentment from the child were used as a positive indication in the construction of the achievement meaning dimension. Monifa's father explained:

> Monifa's father: I mean, to be honest, I don't really get stuck into what she does that much because she tends to be reasonably comfortable with it...she's doing well...she looks forward to going to school, which is one of the

things we pick up on, to see how she feels on Monday morning, if she's up and ready to go

Sarah: Do you take a lot of your clues from how Monifa is acting or reacting?

Monifa's father: Yeah, how she is acting, I pick that up. More from how she's acting, body language, she wears her feelings on her face, you can tell what's inside, or she's concerned, yeah

(Black African: school A, year 6, HA)

Louise's father (White British: school A, year 6, HA) had a similar approach to understanding achievement in terms of an emotional response from the child, he said 'as I say, I talk to my kids and I know how they're feeling within themselves. I know whether they're doing as well as they can'. Children's emotions as indicators to achievement can be misleading and the child is not always a reliable source for understanding progress or achievement. Monifa (Black African child: school A, year 6, HA) explained to me in her interview that she tried to hide her feelings from her parents 'I make sure I don't tell her most things...I'm really secretive sometimes'. In a similar vein, although Rajesh was very happy at school and displayed this positively to his parents, he was in fact a low achieving child. A similar effect was observable at the level of the classroom. The low achieving children in year 2 of school A gave no indication that they considered that they were low achieving children. A child may therefore exude an unrealistic level of confidence in the meanings they construct surrounding their own achievement, which affects their parents' understanding of achievement also.

Some parents searched for other cues from their child to try and understand their child's achievement, by way of questioning the position of the child in the context of the organisation of the classroom. Michael's mother (White British: school A, year 2, HA) frequently questioned her child about his position in the class and had figured out that the children who he sat with were of a similar level of achievement. His mother pieced together clues from asking Michael questions about what work other children did and related this to her own son's achievement. Other parents and friends would also help her piece together a comparison of her son's work to that of other children. Two of the parents out of the sample used siblings to compare and frame the child's learning. Anthony's parents (White British: school B, year 6, HA) for example, noted that Anthony was achieving at a much higher level than his older sister had at the same age.

In short, parents appeared to use the child as a source of information for understanding the child's achievement in two ways: (i) by exploring the child's emotional response to school and (ii) by examining the child's position within the context of the classroom and other pupils. The first cue, looking towards the child's emotional response surrounding school learning, is representational in that the cue relies on the child presenting a genuine emotional feeling as well as the parent correctly interpreting the interaction. Edwards and Alldred (2000) revealed that children filter information to their parents from school, sometimes because they seek to protect their parents from negative aspects of their lives. The second cue is more concrete in that the physical organisation of the children in the classroom is meaningful (as the layout of the classrooms in appendix 8.1

revealed). However, the parents must possess some prior knowledge of the way a classroom is organised in order to make a judgement about their own child's achievement based on the information.

Source: examination assessment results

Examination results from the Standard Assessment Tests (SATs) conducted in year 2 and year 6 were also a source used by some of the parents. Consistently in this sample, parents of high achieving children had a clearer idea of the scoring system and used this to measure their child's achievement. Moreover, some of the parents of low achieving children weren't even aware that their child was taking exams, this was particularly true in school A (School B held an open day to discuss the SATs so parents reported little confusion over the SATs examinations). When I asked Catherine, a year 2 teacher in school A, whether she thought parents understood the level at which their child was achieving in mathematics, she told me:

> Catherine: Mostly not, no. They don't, even when the levels relate to the National Curriculum they don't know. There are parents, even though it's been going so long, that don't know that they should be at level 2 at this year, at this age. And they don't know whether one is better, or one is worse. They don't know which way the numbers go...I mean every time, when it goes home at the end of the year they get a little bit on the bottom which says 'the child at this age should be attaining level 2' etc. etc. that's the national average. But some parents they say 'I don't understand this, is this good or is this bad?'
>
> (Teacher: school A, year 2, HA)

Catherine had realised that the actual form of communicating the SATs results to some parents hadn't worked, but her expectations were that parents should understand the system now because this form of scoring has been in place since the exams had been introduced. However, Catherine did not make allowances for the fact that the parents were educated in a system where exams were graded under an A-G classification. Furthermore, the parent who is experiencing the system for the first time (such as the ethnic minority parent educated abroad), or the parents whose first child is going through the system, may not have had the opportunity to be introduced to the National Curriculum mode of education.

The majority of the parents who knew that the SATs examinations were taking place had negative feelings about the tests. Some thought the children were too young and others felt that the SATs examinations were for the schools benefit, and not for the children. Rajesh's mother was unique in her opinion about testing and its usefulness in understanding achievement. This may have been because she may have been naïve about how the schools use the test results:

> Rajesh's mother: I reckon tests are good because **it will show him what he needs to go further on and what he needs to learn**...I think he's going to have tests his whole life so he might as well start now...**they're not going to judge the kid**, if he's bad or anything it just means he needs more help which is good in a way
>
> (Indian mother: school A, year 2, LA)

Rajesh's mother also held the belief that there would be some kind of positive feedback from the tests, which would help her son realise his mistakes and improve. However, once the final examinations had been finished, the schools in this sample did not revisit the papers.

Despite the scepticism with which some of the teachers spoke about the usefulness of SATs examinations as a means of understanding achievement, they all referred to the exams to classify the children in this study under high or low achievement. Furthermore, some parents thought that the teachers did succumb to the pressure of producing good examination results:

> James' mother: I thought it was ridiculous, she [the teacher, Catherine] sent home a sheet with all this revision fodder and I thought that was a bit off really because I don't, you know, **these aren't exams to cram for, they're just to see how they're getting on**
>
> (White British: school A, year 2, LA)

Clearly the pressure on teachers to produce good results for the school is enormous and the parents of children in school A particularly felt a sense of this pressure. Dale's father (White British: school A, year 6, LA) shared this low opinion on the value of examinations as a means of understanding achievement. Note that in the next quote his father is very aware of the onus the school placed on the SATs and echoes, as previously mentioned, the feelings of some parents that the SATs are there for the school, not the child:

> Dale's father: I find going into school reinforces my idea that they put you in a pigeonhole at the earliest opportunity; that's the line, you're this side of the line, you'll always be the worst. Well, all right, he's a couple of digits down on a maths test, it's not the end of the world but to listen to them talk sometimes; is that because of the concern for Dale or is it because they're concerned the school is going to get a bad report because the Stats *[sic]* are down...and I sometimes wonder exactly what it's for, this sort of test thing
>
> Dale's mother: I think what you're saying makes absolute sense. I think a lot of the SATs are to monitor the school rather than the children and I think it's highly unfair to put the children through that sort of experience when other forms of monitoring could be put into place
>
> (White British: school A, year 6, LA)

These parents were describing how, in their view, SATs examinations have little value as a tool for helping the child, but are instead used as a form of classification.

Interestingly, with the exception of two parents (Amira's and Rajesh's mothers) the parents of low achieving children had more negative feelings towards the examinations than parents of high achieving children. The desire that the parents in this sample expressed for their children to do well could be said to contribute towards their opposing opinion on examinations. Parents here were concerned about seeing their children fail, something that is more likely to happen to the low achieving children. Amira's mother (Pakistani: school A, year 6, LA) held the

belief that education is better in Pakistan for a child of the same age as her daughter than in Britain. The education system in Pakistan utilises the use of examinations on a regular basis, and indicates that her support for examinations can be interpreted as a cultural representation of education. This next quote from Shazia, a Pakistani teacher, supports how Amira's mother might have come across her representations of examinations:

> Sarah: Do you think parents understand the level at which their children are achieving at?
>
> Shazia: Um, I wouldn't say our parents do, not to a great degree. Um, the schooling system in a lot of their countries of origin is very much, it's numbered in the amount...and a child does not go on to the next class unless they pass their year test...then they pass and then go up. So parents refer to our schooling in the same way, 'did they pass their test?' that's what they want to know, if they want to know anything, 'what position are they?' It's quite difficult to explain that we don't actually have tests, because then 'why do they come to school if they don't have tests?' you know. We do actually do end of year tests, but they're quite, they're more informative than anything, they're for our own assessment purposes and our own planning purposes
>
> (Teacher: pilot school, year 6, mixed achievement)

Parents' difficulties in interpreting the SATs examination results revealed that even as a concrete source of information about the child's achievement, exam results can have their own interpretive problems. Changes in the structure of

mathematical practice in school over time have contributed to an alienation of parents from the education system. Furthermore, the White British parents mentioned the examinations in relation to achievement more often than the ethnic minority parents, which may also be a consequence of their own experiences within the education system. None of the White British parents would have taken examinations at the age of six or seven years. Some of the parents might have taken the '11+' examinations at the age of eleven years, and others would not have taken any examinations until they reached secondary school.

Source: child development

Juxtapositioned against the need to understand achievement was the belief that the children were very much in the early stages of their own development. Parents' representations about child development influenced what they considered their child should be achieving at that given time. Furthermore, parents' understanding of child development played a pervasive role in the practices, personal values, beliefs and symbolic sources surrounding their child's school learning. In fact, child development was the only source attached to the construct of achievement that all the parents had mentioned.

When parents of year 2 (ages 6/7 years) children mentioned child development, it concerned their belief that their children were still very young. The next quote from Rajesh's mother reveals the conflict between her own construction of child development and her desire for her child to be successful early in life:

> Rajesh's mother: But then I'm thinking like, his education is important at the moment but it's still a bit of a laugh for him so I don't really want to burden, like I don't want to be like a fussy parent saying I'm pushing him or something...but at the moment **you think he's only seven**, you don't really want to push him too much, cos you're stuck in the middle. Then you think if he has a good start now then he'll have a good start, you know. I don't know, it's a bit difficult
>
> (Indian: school A, year 2, LA)

The inter-related nature of the meaning construct of achievement and her use of the source of representations of child development is very apparent here, and they are both tied in with her identity as a good parent. A number of the parents expressed conflict between wanting to understand their child's achievement levels and their perceived understandings about child development and youth. Interestingly, it became evident throughout the interview that Rajesh's mother had no idea about the SATs examinations he was taking at the end of his time in year 2. I asked her:

> Sarah: Did you know that he'd done SATs exams?
>
> Rajesh's mother: No...what is SATs anyway, what does that mean?

Out of all of the parents, her idea of achievement for a child in year 2 was most dissonant from the expectations of the school at the micro level, and the government at a macro, institutional level. In contrast, Michael's mother and James' mother (White British parents of high achieving children; year 2) were

keenly aware of the pressure on the children to perform adequately. James' mother said:

> James' mother: I do worry whether we are pushing them a bit, **at the age they are**...on the whole, yeah, no, no he's done well. You know, bearing in **mind he's still only little**, umm, **he's done well and for a child of his age,** he's done all right

Discussions around child development were frequently evoked when the SATs examinations were part of the discourse. Jennifer's mother told me about the extra lessons[3] her daughter had to undertake prior to the SATs examinations. When I asked her how she felt about them, she told me:

> Jennifer's mother: I didn't particularly want her to do them, I think it's an awful lot of pressure on a seven year old, I think the fact that she's at school five days a week, I think they ought to be able to prepare the children for their SATs in the classroom time. And I spoke to the Head Teacher about it and he said 'well, if you violently object them she doesn't have to [do the classes] but it won't go down very well basically
>
> (White British: school B, year 2, HA)

This parent's own representation of child development are clearly at odds with the school. As an astute parent, Jennifer's mother questioned the schools motive for the booster lessons. It was her opinion that the school wanted to produce good

[3] The extra lessons that children take are called booster classes

results in the SATs examinations so that they would be given more funding. Dale's parents (White British: school A, year 6, LA) were both of the view that the children were too young to take SATs examinations, even in year 6 (10/11 years of age). Interestingly, some of the parents educated within the British school system are likely to have taken statutory examinations at the same age as their children, in the form of the '11+'. In this instance we can only speculate that if this was the case, and they still felt their children were too young to do the SATs examinations at eleven years of age, that the parent also felt too young to do examinations when they were at school. Or equally, being a parent sheds new light on the representations of child development when it concerns your own children.

Simon's mother drew on her own experiences as a school child to understand the anomalies between her own representations of child development to what her son was experiencing:

> Simon's mother: I just think that **he's seven**, he's in the infants and **if I related to when I was in the infants** we never brought homework home until, I think we just had reading. And part of me thinks **they're just children, let them be children**, you know, if they're happy they'll be learning and I don't want too much pressure on him really
>
> (White British: school B, year 2, HA)

A recurrent idea running through parents' representations of child development was that of learning as a progressive activity. Learning was viewed by many of

the parents as a building block, which develops with the child. The stage-theory representation of child development established through developmental psychology is widespread in the parents' discourse. Learning is described as progressive and based primarily in the childhood years (James' mother), and built on love and respect (Michael's mother). The crux of the problem is that parents' stage-related views on child development are more varied than one might expect. The variations in parents' understanding of learning and development are strongly influenced by their own values and experiences, which were culturally situated. The following table (table 9) presents the answers some of the parents gave to me in response to the question 'when would you recommend parents start doing educational activities with their children?' Admittedly, the question is open to a great deal of interpretation as parents' answers may reflect the time they started school-based activities, as opposed to numeracy practices that occur but go unrecognised as mathematics. However, as an exercise it is still an enlightening one for the sheer variability. Furthermore, in the context of the whole interview the questions had consistently focused on mathematics, although the question above does give the parents license to think beyond the framework of mathematics. However, it was important that the question did not restrict parents to focusing on just 'school-based' learning.

Table 9. A breakdown of the ages parents recommend commencing educational activities

Parent	Details	Year Group	Achievement	Quote
Jamal's mother	Bangladeshi	2	HA	I think from an early age, when they've got understanding. Yeah, from about 3, 2 or 3 [years].
Monifa's dad	Black Caribbean	6	HA	I think it should be, say around 6, 7 [years]
S umana's mother	Indian	6	HA	Well you can start when they're 1 [year], 6 months can't you?
Samuel's mother	Mixed Race (Black Caribbean/White British)	2	HA	I suppose I can remember reading to mine before they could even speak
Nimrat's mother	Indian	6	HA	Well, day one. It's all education isn't it?
Rajesh's mother	Indian	2	LA	We start giving them education as soon as they understand...I'd say after a year
Amira's mother	Pakistani	6	LA	From the age of 3 [years], that's when children really start learning.
Adam's mother	Mixed Race (Black African/White British)	6	LA	As early as possible...it must have been 4 [years], because he was at playschool, if not earlier
Natalie's mother	French/Italian	6	LA	As soon as they can crawl really, you know
Fazain's mother	Pakistani	6	LA	As soon as they can crawl really
Dima's mother	White/Chinese	2	HA	A few months old
Michael's mother	White British	2	HA	I think from go, I think, we used to count the poppers on the baby-grow

James's mother	White British	2	HA	Day one, very early, very early
Simon's mother	White British	2	HA	From when they're babies
Amy's mother	White British	2	LA	Probably when they're just beginning to play, from about 3 [years]
Lee's mother	White British	6	LA	I suppose in the infants age...not in the 4+, sort of the next year, year 1 [ages 5/6 years]
Louise's dad	White British	6	HA	2, 3 [years], as I say early. Because they're little sponges at that age
Anthony's mother	White British	6	HA	I think they should always be involved as early as possible
Dale's mother	White British	6	LA	As early as possible...you know, 3, 4 [years]
Jack's mother	White British	6	HA	Quite early on, I think 2-ish [years]
Natasha's mother	White British	6	LA	Really, really young, like babies
Jennifer's mother	White British	2	HA	The day they're born

Richard, one of the year 2 teachers in school B, acknowledged that parents' understanding and expectations of the child can be quite different from the teacher's:

> Richard: I still think some parents haven't quite caught onto the idea that **they're seven so we should be expecting quite a lot of them**. Their expectations of what a child can do isn't as high as our expectations...
>
> (Teacher: school B, year 2, mixed achievement)

Jane (Teacher: school A, year 2, LA) on the other hand told me in her interview that parents tended to over-estimate how much their children are capable of, because of the increased exposure to the curriculum via shop bought books and Internet access. This is not actually reflected in the reality put forward by the parents in this sample. Even those who bought mathematics books for their children to work from at home, said they felt out of touch with their child's day-to-day learning. Only one parent had a copy of the National Numeracy Strategy even though it is freely accessible to parents.

Many of the teachers suspected that parents found it increasingly difficult to help their children with home mathematics, as they got older. However, the analysis of the interviews with parents in this sample revealed two different representational ways of thinking about their child's increasing mathematical knowledge with age. Some of the year 2 and year 6 parents looked back to when their child was younger and explained how they had found it harder to help their child learn mathematics then. Some of the year 2 and year 6 parents looked forward into the

future with concern about how they were going to help their child with the mathematics learning. Monifa's father is a parent who fits into the first category, he explained to me:

> Monifa's father: When she was younger she had a lot less ability to concentrate and we really had to, sort of like, threaten her 'you'll get smacked if you don't listen', she would be wandering off...and it was more like something she didn't want to do
>
> (Black African: school A, year 6, HA)

The description of age related problems with learning expressed by Monifa's father are echoed in the following two quotes:

> Amira's mother: I think I have more confidence [to help with homework] than when they were younger...when they were younger they struggled to learn and at this age, when sometimes you stand and talk to the child they understand
>
> (Pakistani: school A, year 6, LA)

> James' mother: **When he was younger, like in year one**...you couldn't set him off to do it on his own, there was a lot more interaction...he wouldn't be able to read what was sent home a lot of the time... and so I would say now, certainly as we've now progressed towards the end of year 2, there's a lot less interaction with his homework than there was when he was younger...it's more in all aspects of his homework, **he's becoming,**

as you would expect a child about to go into junior school, a lot more independent.

(White British: school A, year 2, HA)

This increasing move towards independence with age is an ethos, which dominates at a macro level within society's representations of age-related progress. However, the representation of increasing independence of learning with age could be problematic for those children who struggle with a subject, and more than that, those parents who find it increasingly hard to help their children because of their own insecurities about mathematics.

As mentioned above, some of the parents in the sample looked forward into the future with concern about how they were going to help their child with mathematics. Rajesh's mother (Indian parent of low achieving child) was concerned about the increasingly difficult mathematical work her son would have to do. It is possible to see from her quote how she projected a future understanding of home mathematics:

Rajesh's mother: Cos like, some of these hard maths things I can't do because I never did the thing so I leave that to my husband...I'm ok now but when he gets to eleven or twelve I get a bit worried

(Indian: school A, year 2, LA)

This was also true for Nimrat's mother, whose quote is featured below. When I asked her how confident she felt helping Nimrat with his homework as he got older she told me:

> Nimrat's mother: Less and less. I just don't feel I'm really good enough at my maths, at my own maths, to be confident at helping them with what they're doing. Especially if they were learning it the same way I had to learn it, I might give it a go. But this business of having lots of different strategies and you pick the one that suits you, I don't know any of these strategies so I really couldn't help them
>
> (Indian: pilot school, year 6, HA)

These quotes above reveal an interrelation between parents' confidence with mathematics learning and their own experiences of mathematics at school. The quote from Nimrat's mother is very interesting because one might imagine that her awareness of the fact that children were now allowed to use a number of different mathematical strategies in their work according to current educational practice would improve her opportunity to help her child. However, Nimrat's mother sees the changes in mathematical practice from her own generation to that of her children as a hindrance. Returning to the theoretical discussions of chapter two for the moment, Nimrat's mother reveals here an example of heterochronicity between the past and the present, whereby her own experiences of mathematics and school is very different to that of her children. What is intriguing is the fact

that she is aware of these differences from the past to the present, but still feels unable to reconcile them[4].

Parental representations of child development have been shown to have a pervasive impact on their understanding of achievement. Fundamentally, these representations are bound up with culturally constructed knowledge about child development that exist at the macro level. Table. 9 gave some indication of the variability of educational practice that results from different representations of child development. This particularly has implications for the level of achievement the child enters school with.

Source: schoolbooks

Seven of the twenty-two parents mentioned using the child's schoolbooks as an indication of achievement in school. Parents were permitted to look at their child's work at the second parent consultation evening of the year. Of those seven parents who mentioned using the child's schoolbooks as an indicator of achievement, five had spoken positively about what they had seen in the books. Amira's mother was one of the parents who held a low opinion of the work she saw in her daughter's schoolbooks:

> Sarah: Do you get to see her schoolbooks? How do you feel about the work you see in them?

[4] Parents' past to present experiences with mathematics is explored in greater depth in chapter 6

> Amira's mother: They're good but I think they should be a bit more harder work, than that they were doing. Work should be a little more up than what they were doing
>
> (Pakistani: school A, year 6, LA)

Amira's mother used her nephew's education in Pakistan as a marker for establishing this meaning construct about the level of her daughter's achievement. This mother had used a cultural representation to give meaning to the source, which is in this case, her daughter's schoolbooks. Amira's mother was actually educated under the British School System so it is likely that her nephew acted as a key comparison for her own daughter's age-related progress. It cannot be ruled out that this impression is more pronounced given that Amira is a low achieving child and was producing work, which was considerably more simplistic than the work the high achieving children were undertaking.

Source: homework

Homework is the most direct source of contact between the home and school communities available to parents. Those parents who utilised homework as a source for understanding achievement found that it served only to accentuate the achievement gap for their children. Parents of high achieving children suggested that the homework was too simplistic for their children and all the parents of low achieving child who mentioned homework as a source, spoke about their expectations of the level of work being higher.

While homework was an important source of information for helping parents to understand the achievement of their child, the participants' in their narratives also described homework as a meaning construct in its own right. As a dominating form of home learning it was not surprising that many of the participants created representations and meanings surrounding the practice. Therefore, the concept of homework is discussed in greater depth in its own right in section 4.3.

In summary, the parents interviewed in this study highlighted how important their child's achievement in learning was to them. As proposed at the beginning of the chapter, understanding their child's achievement is like putting together 'pieces of a puzzle' and this led to parents using a variety of sources to do so. Some of these sources were concrete, such as homework and schoolbooks, and therefore made the physical transition between home and school. Other sources were symbolic, such as the representation of child development, and are likely to be developed to a greater extent in the home community. Either way, these sources are open to parental interpretations and influenced by parents' own experiences and representations.

4.2.2. Teachers construction of achievement

All the teachers interviewed had at one point been faced with a situation where parents had asked about the child's position within the class with respect to achievement. Some of the teachers' felt this compromised their professionalism, and was of little benefit to the parent or child. Mary had experienced this difficult

situation in the extreme at a previous post in an independent school and recalls how problematic it can be:

Sarah: Do you think parents should know where their children are [in relation to classmates achievement]?

Mary: Well, as I've said I've worked in two independent schools and the first one that I worked for quite a number of years; and they used to have exams and they used to have term tests, and then exams once a year in every year group. And they would put on the report where the child came in the class in that subject. And there was always a lot of explaining, you know, the parents would come in and say 'I'm very concerned that he's only fifteenth out of thirty of whatever' and that kind of thing. But often exams and tests don't truly reflect a child's ability anyway because they may be having a bad day, or making silly mistakes but their method is correct. So it is quite difficult really, to

Sarah: Did that put you in a difficult position as a teacher?

Mary: I didn't like, I didn't really like that because I don't think it's necessary to know what a child's position is in the class.

(Teacher: school A, year 6, LA)

Chris vacillates between his own personal feelings about discussions on achievement with parents, to that of his professional stance:

Chris: I think it's important that a parent knows what their child achieves. But you're right, they have to have the context of that. Compared to what, what are they doing in year 5, 4, 3? But also, I think it's important for

parents to know, to be able to compare their child with other children in the class. You know, is my child at the top, at the bottom, in the middle? You don't see that

Sarah: Have any parents ever asked you that?

Chris: Yes, during parents evening is usually when I get those kind of questions. Um, you know, 'how's my child doing in maths?' and my first response is to explain what they have achieved and it's usually followed up with 'how is that really?' and then 'that means that your child is doing really good work but needs to improve in whatever'. I don't feel that I can say on an old-fashioned scale I would have given them a B, I don't feel I can say that, I don't think that would be a professional way to approach it because the rest of the school doesn't do that. Personally that's what I would love to do

(Teacher: school B, year 6, LA)

A number of the teachers felt it wasn't appropriate to mention achievement to the parents because achievement could only be relative to that particular class or school. These teachers stressed that even the reporting of SATs data was somewhat subjective to a particular school or town, despite the fact that the government set national targets according to age. Anna mentioned that parents sometimes misunderstood the level of achievement that the teacher intended. She recalled a meeting with Monifa's parents (Black African: school A, year 6, HA) where she described Monifa as bright. Later on in the year, the parents brought in a shop bought book at GCSE level[5], which led Anna to regret having been so

[5] GCSEs are the final school year exams for 16 year olds in the United Kingdom

forthright with her descriptions of their daughter. Richard, on the other hand, was the only teacher who considered parents underestimated their children's abilities in mathematics. This was an unusual instance in the discourse surrounding teacher's descriptions of achievement.

Below are the sources, which teachers mentioned when referring to achievement in learning. The teachers used less sources than the parents, perhaps because their status within the learning community allowed them to be more confident about their meaning constructs.

Source: representations of parents

The narratives of the teachers who took the low achieving children revealed different meaning constructs for achievement to that of the teachers who took the high achieving children. Chris' narrative about parents is dominated by the idea that stress and pressure surrounds home mathematics learning. The following quote is one example from his interview, which illustrates this representation:

> Chris: I think you get a lot of parent involvement when the parents are very knowledgeable at subjects and feel comfortable about school in general. And there are a lot of social and economical forces in place that kind of throw up new barriers in that, that whole line of thinking. I've got twenty-nine pupils of lower ability maths in my set and I would say that the majority of them, their parents are not terribly comfortable with the subject of mathematics

Chris' view of home mathematics learning appears to be a consequence of teaching the low achieving group, whereby he assumes that mathematics for many of these parents may be difficult. Similarly, that some of these parents want their children to do well and therefore put pressure on them at home to succeed. However, later in the interview he speaks about the low ambitions of some of the children in his group, which he attributes to a negative parent ethos about education at home. Mary (school A, year 6, LA) also constructs the home influences on achievement in a negative way:

> Mary: The general impressions that I get is that there is quite a bit of apathy, which again explains why a lot of those children are in that group that they're in...because they don't get the extra support at home, I would think, there hasn't been that constant thing going through

However, Mary has had to construct this meaning without using the parents as the direct source. Mary claimed she had not had direct contact with any of the parents whose children were in her low achieving mathematics group (an issue contested by Amira's mother) because, as explained in chapter three, she was not a teacher who had her own class but taught low achieving groups across a number of year groups. This meant that she relied on information from class teachers, homework and the children themselves to connect achievement and home background. Furthermore, the 'apathy' that Mary assigns to parents of low achievers shows a dominant representation of these homes as 'deficient' or 'unwilling', that has been challenged in the literature, as reported in chapter one.

Richard (school B, year 2, mixed achievement) and Jane (school A, year 2, LA) both shared the notion that support at home set the high achievers and low achievers apart. Richard, at the beginning of his interview suggested that high levels of parental involvement allowed him to push the children further in class because he could build upon the support the children received at home. However, this is a misapprehension because the children whose parents can't or won't offer much support will slip further behind, thereby making the gap in achievement even greater. Jane described homework as a useful tool for improving achievement:

> Jane: Children who have parental input, there are big differences who have very little or none...yeah, especially the group I teach you get a very big, I get children every week who return their homework, they're the children who are going to do well
>
> (Teacher: school A, year 2, LA)

Jane had the strongest convictions of all the teachers interviewed that homework makes a big difference in terms of a child's achievement. The sources she used to construct this representation were three-fold, i) through governmental statistics, ii) through research and iii) using her own experience in the classroom.

Source: biological functioning versus environmental factors

The teachers sought to understand the root cause of success or failure in mathematics. To do so, the teachers had to construct their own meaningful representations of achievement. The teachers in the study were asked why they

thought some children did better in mathematics than other children to gain some insight into the ways they represented the children's mathematical success or failure.

There may never be an answer to this question but the teachers' theories on this problem gave some indication about the way they understood and conducted mathematical practice. All but two of the teachers in this sample wavered between achievement in mathematics relating to the brain and biological functioning or to the environment. This isn't surprising given that numerous research studies have not provided teachers with the answer. Catherine, who took the high achieving children (school A), fell strongly on to the biological side of the fence, relating brain functioning with gender issues:

> Catherine: I think they sometimes have a mathematical brain, I think it's down to all that business. It is the boys, in the main, that shine in maths...I think people like to say that boys and girls are equally able and they want them all to be at the same level. But I think that you've got to accept at the end of the day that boy's brains, in the main, work differently from girl's brains...you can't fight against that, you can't fight against nature. I think we just have to accept it and work with it
>
> (school A: year 2, HA)

The gap in the achievement levels between girls and boys has closed considerably in the last few years, but this teacher's representations of gender difference persist.

At the other extreme to Catherine's opinion is Anna's suggestion that success in mathematics is a product of the environment. Anna placed a great deal of emphasis on the home environment and the attitude towards mathematics that is fostered at home. She also considered that literacy based activities dominated the home environment which meant that less numeracy was practised in the home.

Chris used both biological brain functioning and external influences in his answer to the problem of success or failure in mathematics:

Chris: I do think it's just, some children use a part of their brain that other children don't. I know that mathematical, maths in general works on one side of the brain and creativity is on the other side, you know, writing and art. I'm sure it's a number of factors and unless it's a medical problem, unless it's some sort of severe disorder, which is blocking it, it doesn't really matter. Because I think anybody can be good at maths so long as you've got the right strategies.

Sarah: So you feel that if those factors were in place that every child could essentially, other than the ones who have a biological problem?

Chris: Yeah, I honestly do believe that if you can identify a pupil who does not learn maths, for lack of a better word, in a traditional way, and if you can create strategies for that child, everyone will have the same access to the knowledge and will be able to achieve in the same way

(Teacher: school B, year 6, LA)

Chris' enduring belief that, given the right circumstances, the low achieving children could do as well in mathematics as any other child may again be a product of teaching this group of children. The beginning of Chris' quote indicates that he initially builds upon simplistic characteristics of the brain such as left or right hemispherical talents. But biological explanations are then attributed to some kind of dysfunction, which allows Chris to have a representation of achievement as socially situated. In doing so, this representation allows him to sustain the belief that he, as a teacher, can influence the children's mathematical success or failure. To retain the opinion that success is mainly biological would be to give up the idea that he, as a teacher, could improve their mathematical skills.

Source: representations of child development

As in the parents' interviews, representations of child development could be found in the teacher interviews as well. The teachers' personal conceptions of child development were not that far removed from the parents, whatever it might be that they did on behalf of the school as an institution. Chris and Richard spoke on behalf of the teachers when they said:

> Richard: For this age group I don't think we should give them too much, I think they should still be playing…I think with this age group, by the time they've got home, or they've been swimming, or they've done something else; if you give them too much then it's bedtime already
>
> (Teacher: school B, year 2, mixed achievement)

When reflecting on child development, the teachers in this sample recognised that there were some practical difficulties to overloading children in the primary years, such as the large proportion of the children in this study engaged in extra-curricular activities. Richard's quote reveals that this is particularly relevant for the year two children (ages 6/7 years). However, Chris' quote exemplifies the point made by the other year 6 teachers as well:

> Chris: I feel the same way, an antipathy towards homework for children of this age. They're quite young and high schools going to quite difficult for them, they'll have plenty of work to do there
>
> (Teacher: school B, year 6, LA)

Even in year 6 (the last year before the children move on to high school) there is an ethos surrounding primary education, which seeks to maintain the sacredness of childhood. The dominant representation of child development, in Western societies, is that early childhood is not a time for over-burdening the child with too many responsibilities. Chris' reference to the hard work the children will have to undertake in high school is viewed as a rite of passage to increasing responsibility.

Shazia, as the only ethnic minority teacher in the sample is able to demonstrate how extra pressures impact on some of the ethnic minority children:

> Shazia: If you bear in mind that a vast majority of our children at this school are Muslim, and they also go to Mosque after school, some of them go say,

> from 4.30 to 6.30. And then you also expect them to do half an hour reading and half an hour of maths or whatever. That takes them close to 8.00 and then, you know, we expect them to be in bed at a decent time because then when they come into school they're tired. You know, when exactly are they supposed to have leisure time?
>
> (Teacher: pilot school, year 6, mixed achievement)

Extra-curricular activities that the children of White British children engaged in usually centred on non-academic or creative/sporting pursuits. Shazia's quote shows that some ethnic minority pupils have a different level of commitment to out-of-school activities, which might not be understood in the school community. These out-of-school commitments indicate an ethos to learning outside of school, and indeed child development, which is not necessarily shared by every cultural community.

In summary, the teachers drew on three sources of representation as a means of interpreting and understanding the achievement of their pupils in mathematics: (i) an understanding of parents and parental involvement in home learning, (ii) the root causes of success or failure as it is manifested through biological and/or environmental factors and (iii) age-related issues reflected in notions of child development. What the teachers in this study shared in common was the belief that the parents were influential in affecting the success or failure of the children's learning of mathematics. The contradictions occur when teachers attempt to pin-down the problem in relation to the nature versus nurture dichotomy. The notion that parental help is important, and that mathematical success is a consequence of

brain functioning are contradictory. Chris is an example of a teacher who struggled to reconcile these two representations because as a teacher of a low achieving group he had a greater interest in believing he could make a difference. Catherine, on the other hand, as a teacher of high achieving children had less at stake if she relied on the nature paradigm. The importance of age-related representations of children's learning is noteworthy in the pervasive way it had shaped the teachers' as well as the parents' notions of achievement.

4.2.3 Children's construction of achievement

The construct of achievement was prevalent throughout the children's interviews, fuelling the notion that school as an institution is dominated by this representation. Achievement was important to most of the children in the sample, and many of them used sources to help understand their achievement in mathematics. For some children it was enough that they enjoyed their numeracy lessons and felt confident answering the questions. However, it did not necessarily follow that these children were all high achievers.

The younger children had the most disparate reasons as to why they thought some children were successful in mathematics while others were not. This was partly because the younger children related predominantly to their own experiences rather than representations of achievement in general terms. For example, one low achieving year 2 child in school A, had bad eyesight but refused to wear glasses, and therefore gave this as her reason why some children might or might not, have more difficulties in mathematics.

The four most common sources for understanding why the children in the study thought some children were more successful in mathematics than others were: (i) practice at home, (ii) listening and concentrating, (iii) enjoyment of the subject and (iv) biology (a good brain)

Source: practicing at home

The children's overriding reason for success in mathematics was practicing at home. Twenty-five of the fifty-eight children interviewed claimed that time spent by parents on the children's learning in the home community was synonymous with success in mathematics at school. Of those twenty-five pupils, thirteen were high achievers. Some of the low achieving children named fellow classmates who they perceived as having a lot of home support and connected this to high levels of success at school.

Source: listening and concentrating

The next most prevalent representation of success in mathematics was good listening and concentration in class. This was only mentioned by the year 6 (10/11 years of age) pupils and most of those were low achievers. These low achievers tended to mention misbehaviour within the category of listening, giving some indication that poor behaviour dominates a low achieving classroom more than a high achieving classroom. This is supported by the ethnographic observations of the classrooms as part of this research. Again, poor behaviour in the low achieving groups was seen only in the year 6 age group.

Source: enjoyment of the subject

Five of the year 6 children mentioned that enjoyment of a subject went hand-in-hand with success. Only one of these children was a low achiever and as a general rule children enjoyed subjects, which they felt they had achieved well in.

Source: biology

Finally, three of the children drew on biological representations of achievement such as 'a good brain' to help understand success in mathematics. All of the children who referred to biology were high achieving children and they all interchanged between practice at home and brain size.

In summary, there are two issues to raise when looking at the sources used by the children to understand achievement. Firstly, child development is an important factor in the increasingly sophisticated ways that the children seek to understand success or failure in mathematics at school. This is visible in the example of the year 2 child who suggested failure in mathematics was associated with poor eyesight compared to the practising at home explanation, which was predominantly mentioned by year 6 pupils. But the sources the children used can be viewed from another dimension, that of the level of achievement of the interviewees. Biological brain function and enjoyment of mathematics are both sources, which were for the most part mentioned by high achieving children. This is not surprising since success and enjoyment are normally synonymous with each other. Furthermore, a high achieving individual is going to feel more comfortable

with biological explanations of the achievement because they are not hindered by the deterministic notion that the brain would ever prevent the individual from improving. Listening and concentrating was the for the main part discussed by the low achieving children, which as explained previously might relate to the disruptive nature of the two year 6 of the low achieving classrooms in the present study. Furthermore, a child who does not feel successful in mathematics learning may find it hard to engage within the classroom leading to a lack of concentration and listening. The ethnographic observations confirmed that the low achieving classrooms had a greater tendency to facilitate bad behaviour (year 6 only), despite the teacher's calls for the children's attention.

Out of all the sources mentioned it is perhaps the notion that practising at home contributes to achievement, which is the most intriguing. What is intriguing about the group of children who mentioned this source is that twelve of these children were themselves low achieving children. One might surmise that these children are reflecting on their own home learning or extending an identity of a successful pupil from other children who they perceive as highly achieving. Equally interesting, perhaps because of its absence, is the lack of differences between the ethnic minority children and the White British children and the sources that were mentioned with reference to achievement. The ethnic minority and White British children described the largest source of information, namely practicing at home, with equal balance. The biological source of explanation did have two out of three children from the ethnic minority sample (Monifa – Black African and Sherrise –

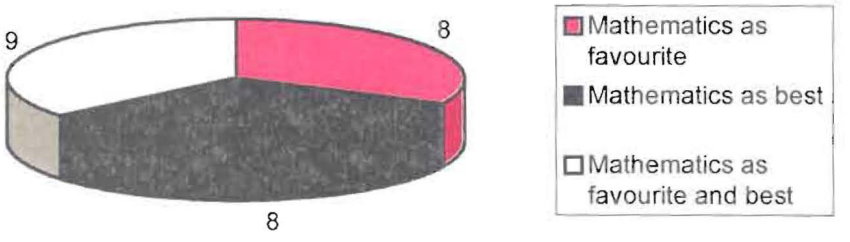
Black Caribbean) but these numbers are too small to draw any conclusions about the differences between the two groups.

As previously mentioned, the enjoyment of a subject and the achievement in that subject are usually considered synonymous. The next section explores the children's favourite and worst subjects and reflects on those instances when there exceptions to the rule as a way of exploring how they make meaning of achievement.

The children's favourite and worst subjects

The children were asked about their favourite/least favourite subjects and the subject they felt best/worst at, as a means of gaining some understanding about how the children's feelings about a subject related to their achievement in the subject. One might surmise that those children whose achievement was low would feel more negative towards mathematics. The following chart begins by revealing a breakdown of the number of children who rated numeracy as their favourite subject, their best subject, or picked mathematics for both categories:

Table. 10. A breakdown of the children who rated numeracy as their favourite, best, or favourite and best subject



Out of twenty-five children who chose mathematics as their favourite or best subject, seven were low achieving children. All of these seven children were in year 6 with the exception of three. Of particular relevance are those children who were classified as low achieving in numeracy by the teacher, but described mathematics as their best or favourite subject. The following table reveals these children's answers about why maths was their favourite or best subject:

Table. 11. Quotations from the low achieving children who described mathematics as their best or favourite subjects.

Child	Year Group	School	Quote
Jodie	2	A	I like doing quite a lot of sums, quite a lot of money
Mitul	2	A	Numeracy...because we get sums there...because I get every single sums right
Rajesh	2	A	I like doing games in the classroom in numeracy and we play hangman and sums games and maths games and we watch videos sometimes, of 'The number crew'
Adam	6	B	I really enjoy it, it's the most easy lesson I understand...I pay more attention to it than other lessons
Elena	6	Pilot	I like maths cos its, um, its just like fun...I think I'm good at it and I sit with friends and we talk about it
Amira	6	B	Maths, um, because um, its quite fun and we have good things and its not boring...most of us in our maths group we all like maths, we have nice kind people in maths and we don't have like teachers who tell us off or anything, teachers are really patient

There were eighteen children who rated mathematics as their least favourite or worst subject. The following table gives a breakdown of the seventeen children according to achievement and the school they attended:

Table. 12. A breakdown of the children who rated mathematics as their least favourite or worst subject.

	Least favourite	Worst subject	Both least favourite and worst subject	Totals out of 18
School A	3	3	0	6 out of 18
School B	6	4	2	**12 out of 18**
HA	4	2	0	**6 out of 18**
LA	5	4	2	11 out of 18

There are a number of important findings revealed in the table above, and they are highlighted in bold. Foremost, the number of children who rated mathematics as their least favourite or worst subject is markedly higher in school B than in school A. The ethnographic observations revealed a number of possible reasons why this might have been the case. School B maintained mixed ability groups all the way through primary school until year 6, where for the first time they were split according to achievement. One might surmise that this led some pupils to review their identity in terms of their achievement in mathematics, and in turn, the subject itself. The table below displays the reasons why the children rated mathematics as their least favourite and worst subjects and it is possible to see that all but one of the children in school B (year 6) are low achieving children. The one high achieving child from this cohort (Sumana – see table. 13) rated mathematics as her least favourite subject, not because she found it hard, but because she founding it 'boring'. This is the converse of her low achieving peers who all cited some kind of failure of the subject for their reason for not liking it or feeling that it was their worst subject. Steven (school B, year 2, HA) is a similar scenario in that he had a converse opinion about why he rated mathematics as his least favourite

subject. Again, it was not because he found mathematics hard but because he felt frustrated when everyone in the class had to stop what they were doing for those who did find something hard:

Table. 13. Exploring the reasons why the children described mathematics as their least favourite or worst subject

Name of Child	School	Year Group	Level of Achievement	Reason for negativity towards mathematics at school
James	A	2	HA	Compares himself to classmates who he perceives are doing better
Dima	A	2	HA	Time off school for illness means she feels she has fallen behind the others
Ranika	A	6	HA	Compares herself to classmates who she perceives are doing better
Sandra	A	6	LA	Compares herself to classmates who she perceives are doing better
John	A	6	LA	Finds times tables difficult
Jennifer	B	2	HA	Finds times tables difficult
Steven	B	2	HA	Finds it frustrating when the whole class has to stop for teacher explanations when he already knows the answer
Melissa	B	2	LA	Feels she just can't do it
Amy	B	2	LA	Just doesn't like the subject
Adam	B	2	LA	Feels he just can't do it – especially money
Molly	B	2	LA	Feels she just can't do it – especially subtraction, division, and times tables
Sumana	B	6	HA	Finds maths boring – can't see its practical application, particularly fractions
Caroline	B	6	LA	Finds maths boring – hard to pay attention

Chris	B	6	LA	Hard work
David	B	6	LA	Finds times tables and division difficult
Domonic	B	6	LA	Finds maths hard – particularly division and fractions
Natasha	B	6	LA	Gets questions wrong – particularly find fractions hard
Mediha	B	6	LA	Compares herself to classmates who she perceives are doing better

However, it must be noted that four of the low achieving children from school B (year 2) also rated mathematics as their least favourite or worst subjects. Even though this classroom (taught by Richard) was a mixed ability set, all four of these children were on one table. As with all the classrooms studied as part of this research, the children were placed on tables according to their achievement, and differential work and the presence of a permanent classroom assistant at the lowest achieving table made all the children very aware of their positions.

The data in the table above can also be viewed along two different dimensions, one is representational and the other concrete. In explanation, four (2xHA and 2xLA) of the children put forward to me representational reasons for not liking mathematics or classifying it as their worst subject. They shared in common the representation that other classmates were doing better than they were. The rest of the children (with the exception of Sumana and Steven, as explained above) framed their reasons around more concrete explanations such as difficulties with fractions or times tables.

The analysis undertaken in this study exploring the children's construction of achievement has indicated that child development plays an important role in the way the child comes to view their own success or failure. The sources described at the beginning of the section show how children begin to identify themselves (or have the means to articulate how they identify themselves) in increasingly sophisticated ways. Furthermore, children's ratings of their least favourite or worst subjects show that it cannot be categorically assumed that the child shares the teacher's rating of high success in a subject. Or the reverse of this, that a low achieving child automatically identifies with mathematics in a negative way. So what is happening? The data in this study indicates a difference at the level of the school community, since the children in school B showed a higher level of negativity towards the subject than the children in school A. One conjectural way to theorise about this issue is to turn to the cultural ethos of the schools in the study. In the teacher interview with Susan (school B, year 6, HA) she spoke about her past experiences working in another school which had a high proportion of ethnic minority children from South Asian backgrounds. This is what she had to say about that experience:

Sarah: Did you find it hard as White teacher relating to the children where there was such a big group of the same ethnic minority?

Susan: No, not really. I think, they were mainly Asian kids who are very much there to work, the ethos is that you are there to work and because they were very much the majority the competition between them to succeed and do well was really strong so in terms of discipline and actually managing what was going on wasn't a problem. To be honest, in [name

> of city] some of the more difficult teaching practices were in some of the poorer areas where it was very much British kids but the backgrounds were, you know, the child that climbs out the window half way through the lesson because it's bored and doesn't want to be there anymore. Nobody tells you about that in college. Or the opening discussion on a topic on transport where a child who says 'oh, I went on a bus on Sunday', 'that's nice, where did you go?' 'oh, I went to visit me dad in prison', ok follow that one.

Susan, at the beginning of her discourse, is describing a particular kind of work ethic, which is associated with a particular ethnic group. She contrasts a positive work ethic seen in the ethnic minority children with a negative work ethic of working class White British children. Is it possible that the work ethic of a multicultural school is more positive than a mainly white school? The differences between school A and school B are discussed in greater depth in the final chapter.

4.3. Representations of homework

As previously mentioned, homework as the dominating form of communication between the home and school communities played an important part of the interviewees discourse. The interviewees were rarely passive in their acceptance of homework, but conversed about homework as a meaningful construction of the educational world of the child. The key figures in this research could be positive, critical and sometimes puzzled by the practice of homework.

4.3.1. Parents' construction of homework

Homework was particularly crucial to parents as a means of understanding the educational world of the child in the school community and homework formed part of the 'puzzle' in understanding their child's learning on a week-by-week basis. Homework also existed as an avenue of communication for the parents. Parents used homework as a means of understanding achievement, child development, the child and the school environment. As much as homework served as a positive way of understanding the education world of the child, it could elicit misunderstandings and confusion. For example, a number of parents in school A mentioned a particular piece of homework which they had all felt went way beyond their child's capabilities. The fact that so many of the parents had spoken to me about the same scenario suggested confusion across the board.

Source: child

As the only figure in the regular transition between home and school it is not surprising that the child was a key source to parental constructions of homework. The analysis shed light on two main issues evoked by parents when trying to construct an understanding of homework through their child: (i) what purpose did parents consider homework served and, (ii) how much homework did parents think their children should receive?

What is the purpose did parents think homework served?

Parents considered that there were two major purposes to having homework, and surprisingly they had little to do with the direct advancement in learning. The first

purpose parents thought homework served was to increase their child's levels of independence and responsibility in their learning. The following two quotes reveal how homework for independence and responsibility is conveyed through the parent's discourse:

> James' mother: We always try as much as possible to make him, or to get him to do it on his own cos that's the whole point of the homework
>
> (White British: school A, year 2, HA)

> Amira's mother: If they give them homework the children feel they have to be more responsible, they think they have to do this and take it back and they're more excited...and if they don't do homework they have to stay back or something, then they will sit down and do it, they will worry about it more, feel more responsibly that they have to do that
>
> (Pakistani: school A, year 6, LA)

What is interesting about the above quote from Amira's mother is that she found it difficult to focus her daughter's attention on doing homework. Furthermore, her daughter relied quite heavily on her mother for support. In contrast, all of the high achieving children are described by their parents as working at an independent level by the time they are in year 6 in both schools A and B. As an explanation for her daughter's lack of independence, Amira's mother puts the onus on the school to encourage and create a culture of responsibility in her own child. This is not because she lacks this commitment as a parent, but simply because the struggle to encourage her daughter to take responsibility keeps failing. She told me:

Amira's mother: Amira's a bit lazy, she doesn't like to give her brain hard work, she doesn't like to use her brain much. She would rather have me do it, most of the time she'll say 'mum, can you do this for me?' and I say 'it's not my homework, you do it'. I tell [her] which way to go about but she'll keep on pushing until I really do tell her, so I'll get fed-up and I'll give her the answers, until I have to really put her in her place and say 'look, this is your homework, not mine'.

(Pakistani: school A, year 6, LA)

The conflict brought about by homework raised by Amira's mother was a problem for some of the other parents of low achieving children. Homework as a source of conflict and tension has been raised in previous research on a number of occasions (Cooper, 1989; Farrow et al. 1999; Edwards & Warin, 1999). Conflict arose most frequently for the parents of low achieving children who reported that their child needed supervision and someone to help sustain their child's concentration. The next quote is from Amy's mother:

Amy's mother: Amy is somebody who, like some children like to do homework but she doesn't really like to do homework at all, it's like a job to get her to do anything really. I mean if you really, really encourage her then she'll do reading and that but to get her to do anything else is a bit of a chore I must admit

Sarah: Do you end up having a bit of a struggle?

Amy's mother: We do actually, I mean, if my husband tries to do it with her she just really, really plays him up. But as I encourage him to make it sound a

> bit fun then she'll do it with you...she just don't really like homework, she'll mess about with anything rather than do her homework really
>
> (White British: school B, year 2, LA)

Dale's parents (White British: school A, year 6, LA) also reported a similar struggle with him at home. Dale's parents were keen to be involved in his learning at home and cared about his success in school but felt it was a constant battle to get him to engage in any kind of educational activity at home. In turn, they worried that if they pushed him too much it might "turn him off" to learning.

The second dominating purpose of homework mentioned by a minority of the parents, was keeping the children occupied at home. Amira's mother was one of those parents:

> Amira's mother: Everyday they should sit down for at least an hour at home, rather than a half, doing their homework. That would keep them more occupied and more into education side, rather than sitting down and watching TV. The other thing is they're getting bored, they don't have anything to do, they're getting bored
>
> (Pakistani: school A, year 6, LA)

Some parents felt, however, that playing and leisure time played a crucial role in the child's home life.

How much homework did the parents think children should receive?

We have seen from some of the above quotes that the homework scenario can be particularly problematic for parents of low achieving children. Given this situation, it is not surprising that the child played an influential part in parents' representations about how much homework they thought their child should receive. However, as a rule, no consistent pattern existed between parents of high achievers and low achievers concerning how much homework they wanted for their children. In fact, out of all the meaning constructs evoked, homework was the most varied and diverse. Nevertheless, a larger proportion of the parents said they were unhappy with the amount of homework given out by the school. Many of the parents who were unhappy with the amount of homework given out didn't consider that their children were given enough. A small number (three of the twenty-two parents) were unhappy because they didn't think children in the primary years should be given any homework at all.

There seemed to be a great deal of variation in the amount of homework parents reported their children received. Within the same class parents told me their children had homework either once a week or rarely, and a frequent complaint from parents was that homework was not consistently delivered from one week to the next. More than one parent felt children should get homework every night, but that it should be in small fifteen-minute segments. This was particularly important to parents whose children struggled with the demands of homework because of a lack of concentration or a general lack of enthusiasm. The desire for small segments of homework daily may have arisen because of the lack of consistency

in the delivery of homework on a weekly basis. Given that parents used homework for understanding many aspects of the child's learning on a day-to-day and week-by-week time scale, it is not surprising that parents were concerned with a lack of consistency.

Some of the parents of the high achieving children felt that their children needed more homework because they weren't stretched as far as the parents thought capable. When I asked this father what would be an ideal amount of homework for his daughter he replied:

> Monifa's father: I think...she finds it a bit easy [homework]...that probably she could have been given more...I was expecting her to have homework at least once a week, so that maybe every Friday you would expect that she has homework...I would like to see her spending one or two hours a week on homework. So say there's not, it shouldn't be something that she could just whiz through in half an hour. So say that maybe she spend half an hour a day, or 15 minutes a day, or two days in the week she spends doing maybe half an hour each
>
> (Black African: school A, year 6, HA)

The ethnographic observations of the numeracy hour of Monifa's class revealed that the children were given mathematics homework every Friday from a workbook. The class[6] would subsequently analyse the many strategies the children had used at home every Monday morning. Monifa's father did recognise

[6] Whose teacher was Anna: school A, year 6, HA

that his daughter was probably working at an independent level and doing her homework without needing to consult him and this may explain his lack of understanding about how much mathematics homework she received. However, Anna's class aside, there was a general mismatch between the amount of homework the parents said their children did at home and the amount the teachers reported that they gave out. Year 6 parents particularly felt that more frequent and consistent homework would be advantageous in the preparation for High School.

There were equally varied reasons why some of the parents were satisfied with the amount of homework handed out. For example, Michael's mother (White British: school A, year 2, HA) had some understanding of the government guidelines for the amount of homework the children should have because of her role in a local nursery as Chairperson on the committee. Rajesh's mother (Indian: school A, year 2, LA) was not worried with the amount of homework because she continued to go over the subject matter in the worksheet throughout the rest of the week. Out of the sample of twenty-two parents, four were satisfied with the amount of homework their children received and all four of these parents had children in year 2. Parental representations of the amount of homework that their children should get underwent a change as the child got older, and when this is not born out by the school community parents begin to report negativity towards the practice.

Source: child development

The representation of child development was as pervasive a source of information for the construction of homework as it was for the construction of achievement for the parents in this study.

For some of the parents in this study the quality of the homework interaction had changed as their children grew older, even for those parents who had children as young as six and seven years old (year 2). Parents enjoyed the increasing independence in their homework learning that their children acquired as they increased with age:

> Jamal's mother: When he was younger I think we had to go into it in more depth, like explain it word for word. Whereas now, he does understand what needs doing but it's just a matter of how to work it out.
>
> (Bangladeshi: school A, year 2, HA))

The skills a parent needs for helping a child with homework can be significant and it seems from the data in this study, that those skills are tested as much with a young child as they are with an older child. It is not necessarily the advanced stage of mathematics that counts, but the ways in which parents need to find explanations for the mathematics that are problematic. Take for example this next quote from Samuel's mother in which she describes the way she learnt to adapt her communication skills with her son during their homework interaction. I asked her whether the way she helped with her son's homework was different from when he was younger:

Samuel's mother: Well I suppose in a way because I don't sit as much with him and also in the younger days I was like 'no, no, no, mustn't do it like that, no, no, no' and I've learnt not to do that and I've stepped back. What he's done and completed I would say 'oh that's good, what do you think you can do to improve it?' so I've changed, yes I've changed the way I might approach the same problem, my attitudes different

(Mixed Heritage: school B, year 2, HA)

It is notable that both of these parents had children who were high achievers. We may surmise that that their adaptability in managing the homework scenario as their child developed is one of the factors, which has made the process less conflictual. This next parent (also to a year 2 high achieving child) suggested that the homework scenario with her son had not changed as he had developed. However, her description of the homework situation paints a picture of a scene, which promotes and fosters positive learning:

Sarah: Is the way you help with their homework different now from when he was younger? Can you tell me about that?

Michael's mother: No I don't think so, I think it's always been almost a family activity really.

(White British: school A, year 2, HA)

Michael's mother described how Sunday morning would be spent around the kitchen table with her husband doing his college work, and her and Michael doing his homework.

One of the aspects of the homework scenario, which seems to set apart the parents of high achieving and low achieving children is the adaptability and strategies used to deal with the situation. In contrast to the parents above, Amy's mother described the homework interaction with her daughter as altogether different:

> Sarah: Is the way you help with her homework different now from when she was younger? Can you tell me about that?
>
> Amy's mother: Probably a bit more, if she's got homework it's got to be done, obviously wouldn't get her to do it when she was younger, if she didn't want to do it when she was younger I didn't force the issue but now, if she has got homework and its got to be done then I have to sort of try and make her do it really. So it's probably more stricter to do it
>
> (White British: school B, year 2, LA)

Amy's mother, as reported elsewhere in the thesis (see chapter six) struggled to get her daughter to engage in many educational activities at home. The pressure on her as a parent to get Amy to do the work had increased with her child's development. The demands of the school community on the parents meant that Amy's mother had gone from avoiding the homework situation in her daughter's younger years, to forcing her to do the homework as she had grown.

Finally, there were those parents of year 2 children whose representations of child development were so strong that they disagreed with homework altogether:

> Jennifer's mother: I don't think seven year olds should have to bring homework. I think they're at school from nine till three thirty and I think that for a seven year old that is probably quite enough really
>
> (White British: school B, year 2, HA)

> Sarah: Is there any type of homework you would like to see more of? Can you tell me about that if there is?
>
> Simon's mother: Um, the other way really. I just, like I say I don't want, I think, they're children, they're little; he's in the infants still. I just think, just now and again to encourage them and get them going but I don't want to see too much put on them at this stage because I think their childhood is taken away with the pressure of sitting down and doing homework... I don't want to put too much on them and I think, let them have their playtime and be with their friends and not too much homework and things like that. I want them to be children, they grow too quick
>
> (White British: school B, year 2, HA)

Up until this point, these quotations from parents about child development as a source for understanding homework have all been from parents of year 2 (aged 6/7 years) children. The parents of year 6 (aged 10/11 years) children also drew on child development as a source for making meaning about homework. The issues raised by the parents of the older children were very similar to those of the year 2 parents. With age there had come an increased level of independence, which had

helped the parents in this study with the homework situation. The following quote is an exemplification of this point and was described by other parents of both high and low achieving children:

Sarah: Is the way you help with their homework different now from when she was younger? Can you tell me about that?

Elena's mother: It is yeah, because she knows more about it than I do, if you know what I mean. Most of the time she just asks because she's not sure but she'll tell me more about her homework than I can tell her. When she was younger it was so much easier for me to tell here what to do, and how to do it and now I think 'what are they talking about?'

(White European: pilot school, year 6, LA)

Dale's parents, like some of the year 2 parents, were against homework altogether for the primary years:

Dale's mother: I'm against it personally. I'm not happy that they have so much homework at his age really, I think it just turns kids off school sometimes if you're giving it to them at six, seven, eight, nine. When they get to high school, twelve, thirteen, perhaps give them homework but at that age…I just think the schools dump a lot on the parents, 'oh, you're behind, do it at home', you know.

Sarah: So you feel there's a bit of pressure on you to make up for?

Dale's father: Shortfalls of the schools, yeah

(White British: school A, year 6, LA)

It must be noted that Dale's parents were the only ones in the sample to feel that a year 6 pupil should not have so much homework. One might interpret from the quote above that the issue is not just one of child development however, but of the parents' representation that school as an institution struggles to meet a standard of education and uses the parent as a teacher. As parents, their opinion may be more pronounced because they have a child who is struggling to achieve in the educational system.

Through all of the analysis on parental constructions of homework what is perhaps most telling is what parents did *not* talk about. Namely, that the teacher as a source of information for constructing homework had little sway in the discourse of the parents in this study. The data in this study has shown that two major sources of information existed for parents, the child and representations of child development. That is not to say that parents did not speak about interactions with teachers concerning homework, they were however relatively rare. So why did parents rely on the child, or a representational form of source to construct their meanings of homework? The first reason might simply be a matter of ease and frequency. In other words, the parent sees the child on a daily basis and therefore they are the most regular provider of information. For the year 6 parents in school A, gaining access to the teacher was difficult because of the spatial barriers the school had erected (as reported in chapter three, parents were not allowed on to the school grounds unless they had made a prior appointment). Some of the parents with children in Catherine's class (school A, year 2, HA) described how

they found it difficult to approach her. These are both issues, which might lead a parent to seek less complex sources for their meaning constructs.

Additionally, the parents were encouraged by some of the teachers to deliberately use the child as a source of information in the homework scenario. Richard (school B, year 2, mixed group) for example, liked parents to ask the child questions about their homework if the parent lacked an understanding about what the child should be doing. In engaging in this interaction, Richard believed the child increased its own level of understanding about the homework. However, as the data from Amy's mother above showed, getting some children to engage in the homework at all is difficult.

4.3.2. Teachers' construction of homework

Teachers' representations of homework revealed that personal discussions surrounding homework could be quite varied, and did not always reflect or match the official stance of the school or the government. While parents used homework to understand the school community, teachers used homework to piece together information about the home community. This was particularly true of school A junior year (ages 7-11 years) because parents weren't permitted inside the school gate thereby negating any spontaneous parents/teacher contact. In this instance homework (and indeed the child) became the primary mediator of information between the home and school communities. However, as reported in previous sections of this chapter, this is problematic because the child does not always present information accurately or freely.

This section of the chapter will analyse teachers' constructions of homework by asking the following questions: (i) what purpose did teachers think homework served and (ii) how much homework did the teachers think children should receive? What were teachers' expectations of parents in terms of their involvement in homework?

What is the purpose of homework for the teachers?

Jane (school A, year 2, LA) was the strongest supporter of homework and the only teacher to mention homework as a means of increasing achievement. Incidentally, Jane shared the closest representations on education to the official stance than any of the other teachers in the sample and this may explain her unquestioning belief that it would aid achievement. The other teachers in the sample did not directly refer to homework as a means of increasing achievement but did list some other benefits which might contribute to achievement:

i) Revision/reinforcement Independence

ii) Discipline

iii) Study Skills

iv) Time Management

v) Emotional support in learning

There were a number of incongruities in the answers teachers provide about the purpose of homework. Mary, (school A, year 6, LA) spoke about homework being a form of independent learning away from the context of the classroom, however,

she also mentioned the obvious differences between the children who received help at home and those who didn't. Following through with this argument, homework would never be a true indication of what the child can learn independently because it is expected that parents will help. The next two quotes from Mary exemplify this:

> Mary: I think homework is important in that it does help to reinforce what you're doing in the classroom and also because it's a time when, hopefully, you can see the child working independently
>
> (school A, year 6, LA)

However, she goes on to say:

> Mary: **And it's quite easy to see if they've got a lot of support from home as well but it's an opportunity for you to give something out when you're not there and see whether they can do it**...to work independently from the teacher and away from the distractions of the classroom. Um, because they haven't got their friend next to them who is good at maths to ask. They haven't got the teacher to rely on or the LSA [learning support assistant] to help them or, anything else

Homework is not a clear indication of independent learning and Mary's representation of the purpose of homework are contradictory. Anna realises this as she explains:

> Anna: Whether it [homework] is a true assessment of what you have done in class, I don't know, because there's help given at such varying degrees at home. But I don't think really you can judge too much of the child's knowledge on homework because again, it all depends on their background.
>
> (school A, year 6, HA)

Despite this, Anna still declared that homework predominantly acted as a reinforcement to 'check that they can do it on their own'. The lack of consistency in the answers surrounding the purpose of homework is evident in most of the teacher interviews and this may arise because there is conflict between their personal and professional stance. Susan is the teacher most likely to ask pupils to finish off homework that was not completed during the numeracy hour and this was mentioned as a cause for concern by a number of the parents of children in that year group. As a teacher, Shazia also agreed that finishing off class work should not be a regular form of homework:

> Shazia: I tend to have something specifically organised for it [homework]. I have to say this week I didn't, I just asked them to finish some work that they'd started. I tend not to use it for that, I don't think that, that suits any purpose really, just finishing off work. It has to be something that consolidates
>
> (pilot school, year 6, mixed achievement)

Five out of the eight teachers mentioned homework as a mediational means of showing emotional support in learning. They considered that taking an interest in the child's learning would send a message about the value of learning that would increase academic success. Involvement in homework, according to Catherine and Susan fostered a positive attitude and a shared direction of education between the school and the home. Jane explained the differences she saw in the achievement of children whose parents help them with homework:

> Jane: The parents who help their children and work with their children actually have children who have more confidence, more 'have a go at anything' attitude. Some children we don't see homework from one week to the next, or it's never done. We talk to the child and say, it's all wrong, and you say to the child 'did mummy and daddy help you?' and they're like 'no', they're just left to it. So you get a very big divide between the ones who get help and do better and the ones who don't get any help at all
>
> (school A, year 2, LA)

Anna described how parental involvement in homework gave parents an insight into the pressures of school life as well as the sort of work they do, which in turn gives the child someone to turn to for help or advice. Chris looked beyond school, at the child's projected future[7], in his discussions about the value of education promoted at home. In this next quote he pertains to the idea that the way homework is represented at home influences how the child perceives education in general which in turn, impacts on the child's identity as an adult. As part of the

[7] Identity will be discussed in greater depth in chapter 5 and projected futures in chapter 6

PHSE[8] lesson, Chris asked the children in his class what job they would like in the future and he explained his disappointment in their answers:

> Chris: I don't have any evidence to back this up but one worry is that there's a level of excellence that is never strived for because for whatever reason these pupils have 'a lot' in life and you shouldn't try to do too much.
>
> Sarah: On an emotional level there aren't perhaps the goals that other parents?
>
> Chris: That's it, I mean Tanya, I can only tie this in with some of the PHSE work that we've done, and the kind of jobs that some of these pupils conceive of themselves doing are quite limited.
>
> (school B, year 6, LA)

Only one teacher, Richard, mentioned homework as a form of communication between the home and school communities when he said '*show(s) the parents what they can do*'. This representation of homework is the one most closely shared with parents.

How much homework did the teachers think children should receive?

As mentioned briefly in the introduction to the teachers' perspective on homework, their personal discussions surrounding the amount of homework children should receive could be quite different to that of school policy or governmental demands. The exception to this rule, as discussed above, was Jane whose own ideas reflected those of an official stance. Incidentally, Jane was the only teacher who qualified after the onset of the National Numeracy Strategy and

[8] PHSE stands for Personal Health and Social Education and is a forum for discussing life issues

had therefore been trained within that context. Anna was the only teacher who considered that if the children had worked hard enough at school that they shouldn't have to take any homework away at all. The following quote sums up the feelings of all the teachers except Jane:

> Shazia: I personally feel even for year 6 the amount of homework that is set is quite a lot. They're expected to do, I can't even remember the exact guidelines now but about half an hour per day, and that's on top of thirty minutes of reading that they're supposed to do a day
>
> (pilot school, year 6, mixed achievement)

Teachers recognised that extracurricular activities outside of school took up some the children's time and they didn't want to encroach on these activities by giving too much homework. Catherine described here an opinion echoed by many of the teachers in this sample:

> Catherine: I think some of the children do find it a bit too much, they'll come and say 'well I didn't have time to do it, went to Brownies one night and swimming the next night and my mum was busy the next night' you know, sometimes they do find it too much
>
> (school A, year 2, HA)

There was only one instance where a teacher (Anna) was critical of the outside activities of one of the pupils. This was a child who was keen on swimming and undertook training every morning and afternoon. Catherine, in a contradiction to

her quote above showed a lack of understanding about other home values, which may impact on children's ability to get homework done. She said:

> Catherine: I don't think we give them too much at the moment. I think if we gave them anymore it might be too much. I think, and mostly they have a weekend to do it, you're not saying 'do it tonight, I want it back in tomorrow morning'. The numeracy homework they have over the weekend, they should be able to find some time over the weekend when they can [do it]
>
> (school A, year 2, HA)

When I spoke to James' mother about the time she had to help her son with his homework she voiced an opinion contrary to the teacher. The next quote reveals why she felt that way:

> James' mother: I mean we have like, I'm, as Christians we try not to work on Sunday because it's one of the things that we're trying to show that to our children [but it] doesn't always work out because if like this homework has to be back in on a Monday morning and James has a busy day on a Saturday morning, because he does his swimming lesson and he does his tennis, which really on the whole, Friday nights he usually is just not able to think straight, I think, he really seems to need to, seems to need to just
>
> Sarah: Switch off and finish the week
>
> James' mother: Yeah, he just, he just needs to kind of like, often we just kind of just lounge around on a Friday evening or visit a friends and he seems to

need that. So I find that Friday evening it would be pointless to do the numeracy homework with him, so often he does it on a Saturday afternoon, Saturday teatime if we're around, but it sometimes you know we've gone shopping, or we're busy or visiting people so then sometimes we do, do it on a Sunday teatime

Sarah: But it goes against what you what you really believe in?

James' mother: Yeah it does and had we been able to keep it through to the Tuesday I'd make him do it Monday evening after school.

(White British: school A, year 2, HA)

Arguably, the teachers in a different time/historical context may have included Christian work ethics and values in their understanding of the homework situation. However, none of the White British teachers in this study mentioned Sunday as a day of rest. As mentioned previously, Shazia, the Pakistani teacher, spoke about the limitations on time for the Muslim children in her school, who attended Mosque every night for two hours.

In the previous discussions about how much homework parents thought their children should receive there was mention of a lack of consistency that parents reported from teachers. In the case of some teachers, like Anna and Catherine, it has already been established that homework was consistently sent home on a weekly basis. This finding is based on the interviews with parents and supported by the ethnographic observations of the numeracy hour. Mary's description of her homework allocation is somewhat contradictory, whereby she takes an opposing

personal and official stance. The first quote revealed her personal stance and the second quote, revealed at a later point in the interview, is an institutional stance:

> Mary: I don't necessarily think you should have a hard and fast rule that this night is Friday night so it's definitely a homework night and then you have to find something. If it's not going to be relevant, justifying something for the sake of it I don't agree with, but I think it is important to have. But also not overload the children at the same time, it should be something they can do to help them to feel more confident that they can work on their own. If they're going home and panicking about it and having too much then it's not worth it
>
> (school A, year 6, LA)

In a later part of the interview she said:

> Mary: Knowing when your homework is given out, and I think it's the school's responsibility to have set days and not chop and change routines as well. So if the parents know, children know, staff know, the parents then encourage children to get on with it

The second quote reveals a representation that is much more concordant with parents' expectations about how much homework children should get, particularly in relation to the consistency of homework. However, the ethnographic observations of the classroom were a closer reflection of the first quote, whereby the practice of homework was inconsistently delivered. While Mary justified why

she didn't always hand out homework, the parents found it a problem in the home community.

Chris' views on the volume of homework that should be sent home also revealed discordance between his personal stance and the schools official stance, although he is explicit in expressing his contradictory viewpoints:

> Chris: My personal view doesn't actually mesh with the school view in that, school believes in homework every day, five days a week, to be turned in and ticked off as it comes...I just felt it wasn't necessary to have so much homework. I was really worried about levels of stress building up to the SATs anyway. I felt that homework five times a week was just a bit much in the first term, so I scaled it back to basically two or three times a week. And not on the same days, could be Monday or Wednesday, might be a Friday and a Tuesday, they wouldn't know when the homework was coming, and they would some, but not at the same intensity level, and since the SATs I've not given any homework out at all, haven't really felt the need
>
> (school B, year 6, LA)

Chris clearly felt that changing around the delivery and intensity of the homework was a positive thing and he made overtones to suggest that this strategy would be less stressful for the parents and children. However, the parent participants indicated that they preferred consistency because of the many uses that homework served. Furthermore, parents who have little or no understanding about the

educational world of the child while they are at school would have less insight into why the homework ceased after the SATs examination, or the teacher's reasons for reducing the homework. When homework ceases, parents loose an important form of communication with the school.

What do teachers expect from parents in terms of their involvement in homework?

It has now been established that there is some discordance between the representations and expectations in the purpose of homework between the home and school communities. More importantly, there are differences in the way meaning is constructed within the school community and between the teachers. It is not surprising then, that parents found it hard to interpret the expectations of the teachers. This next section details the equally diverse homework scenarios that teachers envisage are ideal in the home community. Clearly, child development will play a role in how teacher best interprets parental help with homework. The gap between the year 2 children (ages 6/7 years) and the year 6 pupils (ages 10/11 years) is quite large. However, the following quotes reveal that even within these year groups, teachers expect different scenarios.

Richard, the year 2 teacher in school B, advocated a scenario whereby the parent and child sit next to each other during homework time because he felt this would parallel the learning situation in school:

Richard: I think at this age you want mum sitting, at least spending some time, a mum or dad, sorry or whoever, at least spending some time sitting next to them and working through the work with them, and talking to them, **cos that's what we try and do here**, where possible...at other times I know they don't have the time but if they could devote some time

(school B, year 2, mixed achievement)

Jane is different in her approach to the ideal homework scenario as the emphasis is away from the one-to-one interaction at a table with the adult and child, as suggested by Richard. Although Jane is likely to advocate the one-to-one interaction at the table she also wants the parents to be proactive in finding useful tools to assist with the work and to engage in conversation about the task:

Jane: I think you need a mixture. The parents are there to help give them confidence but not to do the work in a sense, but to talk about how you solve something 'what did Miss Williams say you need to do, how are you going to solve it?'. But there's no point them doing it for them, child won't learn anything. **If parents are there to help get the cubes out the cupboards or get cups and knives and forks, or whatever to help**, then that's definitely got to be a positive because they're getting that one-to-one

(school A, year 2, LA)

There is an assumption in Jane's quote that parents are equipped with complex tools for helping their children with homework. In the next chapter I will discuss

in detail some of the practical aspects of homework learning, but suffice it to say for now, her expectations of parents reflects a certain representation of numeracy in the home community that is not meaningful in every household.

Catherine (school A, year 2, HA) had another opinion to add about the ideal homework scenario. The text in bold revealed contradictions in her argument:

> Catherine: The ideal scenario is that the parents will say 'lets sit down and you do your homework, but I'm here if you've got any problems'. **You don't necessarily want the parents sitting side by side with the child feeding them the answers**, or whatever. But you want them to be there, you don't want the child in another room totally doing it on their own...

In a later part of the interview she says:

> Some parents do just want the column of sums to keep them quiet. And you can tell when the homework comes back because **sometimes it will come back with the incorrect answers on it, so the parents haven't even looked**. So they have sat them down and they've done it and they haven't even looked to give them any support

The excerpt above shows how difficult it must be for parents to understand what each teacher expects of them. Some of the parents felt that the teacher needed to see where their child had gone wrong while working independently and had therefore made no plans to correct work. Conscientious parents have to learn to be

highly adaptable in their projected notions of what the teacher wants in terms of their involvement in homework as the child goes through primary school. Mary, for instance, recalled situations where she claimed a parent 'did the work for them', which prevented the child from gaining their own understanding of mathematics. Susan wanted parents to double check the work, correct any mistakes but 'not do it for them' as well. Anna thought that if the parent is sitting with the child for the duration of the homework session then it would be too easy for them to be over-critical, particularly in year 6 when the children are older. To add to this confusion, Anna suggested that homework is the means by which expectations are communicated:

> Anna: I think it [homework] does have a valued place in that, the parents should know what our expectations of the children are. And how far we're expecting to get them and perhaps, the different procedures that we use to get them there

It is questionable whether homework, per se could fulfil this complex set of explanations provided by Anna, but the quote may explain why she remained consistent in handing out homework. Chris, on the other hand, is critical of the role that parents are being expected to undertake at home with respect to homework:

> Chris: I think parents are being used as mentors at the moment for their children. Children come to them with either homework or something that hasn't been done and say 'how do I do this?' instead of the approach of

> 'help me understand this' it's 'tell me the answer or tell me how to do this'. That's a lot of pressure on a parent because all of us have been in situations before where we know how to do a particular mathematical process but for whatever reason it's presented in a way where it just doesn't make sense and you don't get it. So, if a parent isn't terribly comfortable with the subject of mathematics, that's happening every time the child brings it home
>
> (Teacher: School B, year 6; LA)

Chris' awareness of the tensions homework can create may have developed through taking the low achievers in mathematics. He, and some of the parents of the children in his class, had recalled that they had been into see Chris about mathematical difficulties that had occurred during homework.

Susan (school B, year 6, HA) took a different approach again and used the achievement of the child as a guide for knowing what the best homework scenario would be. Susan's quote reveals how age becomes an important facet and can be linked with the issue of independence. None of the year 2 teachers mentioned independence as an important skill acquired through homework and so the changing expectations of year 6 pupils are developed over time:

> Susan: Depends on the child, depends on the ability of the child. I think some of those that find school difficult probably still need somebody actually sitting there, not necessarily sitting there with them, but popping backwards and forwards and saying 'how are you getting on? How much

> have you done? You've done that, what about the next bit? What have you got to do now?' I think they're beyond the age of actually needing somebody sat at their elbow while they're doing it, but they do need that support
>
> (school B, year 6, HA)

Shazia is in a different position within the context of her school because she described how there had been a history of a lack of involvement in homework and school learning in general from the parents. She reduced the type of involvement she wanted parents to have in the child's homework simply to an interest at the most basic level:

> Shazia: The parents don't actually ask them, it's not an automatic 'do you get homework, do you have any?'

She went on to attribute this apathy towards homework as a cultural issue. Shazia worked in a school, which is made up of predominantly South Asian pupils. As a member of the Pakistani Kashmiri community herself she gave me her opinion on why the most basic of interests in homework would be a start:

> Shazia: Because a lot of our parents are Asians it's just not one of those priority things. There's other things, family, this and that, and they come up with things that are much more important and it ends up at the bottom of the pile

Other aspects of parental involvement and culture will be included in later sections.

The next scenario idealised by Mary reflected the one that children reported they predominantly engaged in with their parents:

> Mary: I think parents should oversee homework as well, children should do it independently but then I think it's a good idea for parents to go through it afterwards, check they've taken care and if there's anything they're unsure of, obviously guidance but also to perhaps write a note on it to say that guidance was given

Although these representations of the homework scenario are contradictory and diverse, homework was still maintained as an extension of school. Only one teacher (Chris) felt uncomfortable about using parents as untrained teachers. It seems reasonable to suggest that some parents would feel better equipped to help their child with homework in the manner of the teacher than other parents. This raises a question mark about whether the expectations on parents serves merely to increase the gap in those home communities where help can be provided (according to the expectations of the school community) and those where it is less viable. This issue might be particularly pertinent to parents of ethnic minority children. Three of the eleven ethnic minority parents interviewed described how they found it easier to explain the mathematical strategies that they used at school. The following quote from Natasha's mother (White European: pilot school, year

6, LA) could be applicable to other ethnic minority parents, particularly for those born and educated abroad:

> Natasha's mother: For me it's hard to explain to her when she says 'mum, I don't understand' because I've never done that before and unless I know what they're talking about I can't help her because to me it's such a long time ago since I've been to school, it's so different. I've been in a different country as well, it's just so hard for me to explain to her when she doesn't understand, just guess I suppose...I try to explain how we do it in France which is much easier than you do it in England, adding, taking away, but I think I'm confusing her there so I won't bother again.

To really understand if the experiences described here by Natasha's mother is applicable to many other ethnic minority parents educated abroad, further research would be required on a larger sample of parents.

4.3.3. Children's construction of homework

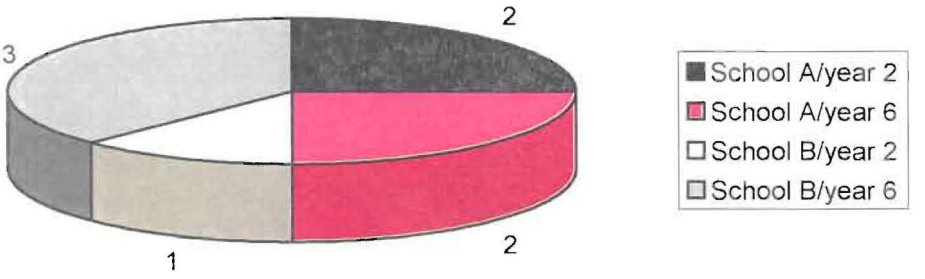
The children in the sample also formed their own meaningful representations of homework. The idea that it is customary for children of the target age group to receive homework was fully embedded in the children's dominant representations of school. This is in contrast to the parents own school experience, as those educated within the British school system did not receive homework until they started at senior school at the age of eleven years. This section on children's representations of homework will focus on two aspects of the same meaning construct; (i) whether the children thought they should have homework and some

of the reasons for holding their representation of homework and (ii) who the key figures were at home that acted as the main tutor in their mathematics homework.

Did the children think they should get homework?

Out of fifty-eight children interviewed only eight thought they should not receive any homework. The following chart (table 14.) looks at the breakdown of those eight children according to their year group and the school they attended:

Table. 14. A breakdown of the eight children who did not think they should receive homework according to year group and school attended



Five of the children who did not want to receive homework were low achievers and three were high achievers. Three of the eight children were from ethnic minority groups (2x school A, year 6 and 1x school B, year 6). The reasons why these children did not want homework were quite diverse and for the some of the younger children (year 2, aged 6/7 years) quite transparent. One of the year 2 boys described how he had to forfeit watching his favourite television programme when

he had homework. For three of the eight children the issue centred on how much homework the teachers gave them and two of these were ethnic minority children (Sherrise: Black Caribbean and Adam: White British/Black African). This was most certainly symptomatic of being in the official SATs years, as many children said they had experienced a sharp increase in the amount of homework they received from school. In both schools, once the SATs were over the homework situation changed. In school A they no longer received mathematics homework and in school B the homework consisted of finishing off class work that had not been completed. Many of the children in school B were not happy that they were expected to finish off class work. But this also shows that these crucial SATs years did change the kind of homework practices that teachers were engaging in. The year 6 children were also aware that when they moved up to senior school the following year, their levels of homework would increase.

Two of the eight children described how home circumstances and responsibilities made it hard for them to complete homework and one of these children was from an ethnic minority community (Kurtis: Black Caribbean). Both of these children had very young siblings who they had to look after and which they told me also created an environment that was not conducive to working on homework. The fact that so few children reported out of school responsibilities impinging on homework may be a reflection of the location in which the study was conducted. It is important to point out that this research is not representative of other areas of Britain, where in rural areas, for example, children may be expected to engage in more work related chores at home.

Only one child in the sample revealed a shared representation of homework that was clearly coming from the home community. I asked her if she thought children of her age should be given homework:

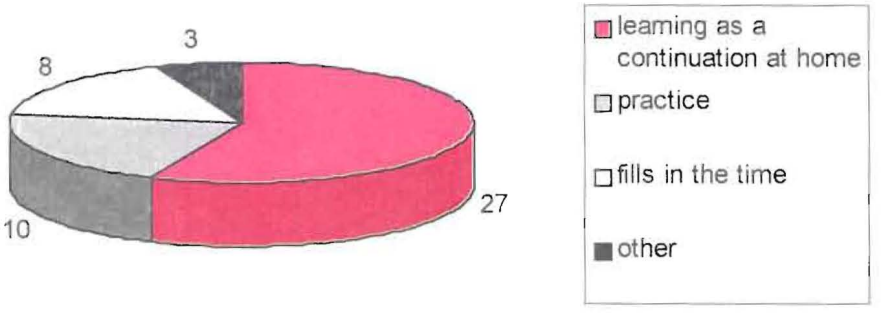
> Caroline: No I don't, like my mum says, when you're at school you should do the work and when you're at home it's your time to do what you want
>
> (White British: school B, year 6, LA)

Those children who said they *should* receive homework generally fit into three categories as to the reasons for their decisions. The first representation for why they should be given homework stemmed from the notion that learning was not the sole domain of school but continued in the home environment. As you can see from table 15, this made up the largest number of representations. The home was often seen as an extension of school and could thereby increase knowledge as much as the school community. The children reported that parents also played a role in the continuation of learning at home.

The second representation of homework as a positive tool for learning was that of practicing. Homework, for these children, was a repetition of schoolwork, it was not for the production of new knowledge, but supported what the school had established. Finally, some children felt that homework filled in the time and was a more positive activity than watching television or playing computer games. Four of the children's answers were not clear and did not fit into any of the categories

described above. The following table reveals how these representations are broken down:

Table. 15. A breakdown of the positive representations of homework

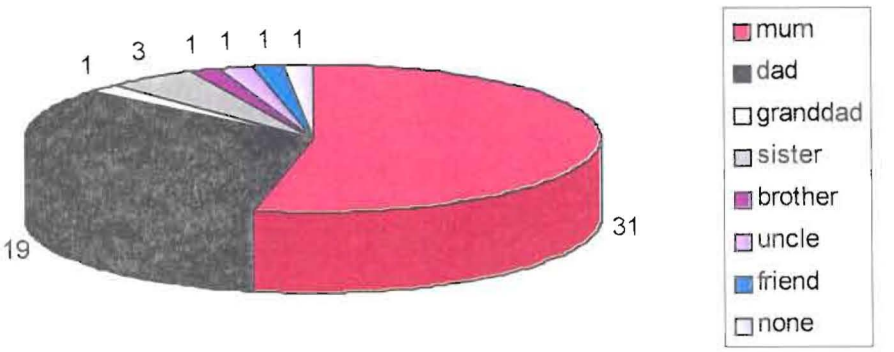


Generally, the older children were more positive about mathematics as homework when they could see there was an applicability of the subject to real life situations.

Who do the children say helps them with homework the most?

Although the mother or father predominantly featured as the main homework helper at home, the children listed a range of other relatives as contributing to help with homework. When the children listed more than one homework helper, they were asked who was most likely to help them the most, and the following chart reveals the children's answers:

Table. 16. A breakdown of the main homework helper



For some children the main homework helper was simply the person who was at home the most, or back from work the earliest. Many of the fathers did not return home from work until late, by which time the homework had been completed. In some households the gender divide between homework subjects was apparent, with fathers helping with mathematics and mothers helping with literacy. In these instances, the mother was represented by the children as being less skilful than the father in mathematics. In the case of the child whose uncle helped she told me:

> Denise: My dad tries to help me but then he's not a very good mathematician as my uncle
>
> (Black Caribbean: school A, year 6, HA)

Although only one brother and three sisters were listed as the main homework helpers, older siblings were often listed among those who contributed. Two of the fifty-eight children mentioned involvement from cousins as well.

One of the more surprising results following the interviews with these children was the number who said that they found the way their main homework helper explained mathematics was easier than the teachers. Some of the children said the homework helper explained their mathematics in the same way, some said it was confusing, others said it was different but equally fine and a small amount of the younger children did not give relevant answers to the question. The following table reveals how children rated their homework according to the school they attended and their levels of achievement

Table. 17. How children rated the help they received at home from their main helper

	School A	School B	Pilot	HA (n=30)	LA (n=22)	Total
Easier	13	9	1	17	7	**24**
Same	9	4	1	6	8	14
Confusing	1	9	0	5	5	**10**
Different	5	1	1	3	4	7
Not relevant	2	2	0	1	3	4
Total						**58**

Those children who said help at home was easier gave the following reasons; (i) the helper was able to spend more time with them individually than a teacher could in class; (ii) helpers tended to use simpler terminology than the teachers and (iii) some of the children mentioned that their helper knew them better and were therefore more equipped to help them understand. The other significant result, highlighted in bold on the above table, were those children who found the help

they got at home confusing. Three of these children mentioned that their parents had been taught in different ways and with different strategies and that the examples they gave their children served only to make it more complicated. Interestingly, all of these children came from school B, the mainly white school. One child mentioned more complicated words were used at home and the remaining children could give no specific reason for the confusion, like Jason, who told me:

> Jason: I think my mum might say it a bit more complicated. Because the teacher's got experiences and she would know how to explain it because she's been given courses and everything. My mum, she thinks she's a mathematician, she is good and everything so she can help a lot but sometimes she needs to explain it a bit more simplified
>
> (Mixed heritage: school B, year 6, HA)

What is most interesting about these nine children from school B, who found home mathematical strategies more confusing, is that five of them were from the ethnic minority group interviewed in the mainly white school (seven ethnic minority children were interviewed from school B). This suggests that the school with mainly white pupils there may be different mathematical practices in the classroom than in the multicultural school. If the home mathematical strategies are very different from those of the school community then this appears to create more confusion in the mainly white school. In a multicultural school this confusion between home and school mathematics may be less pronounced because it is an expected part of classroom practice. This is certainly born out of

the ethnographic observations in Catherine's (school A, year 2, HA) and Anna's (school A, year 2, HA) numeracy hours where the children were actively encouraged to explore different ways of doing a calculation. The following quote from a year 6 pupil in school A illustrates this point. Ranika detailed the difference in the use of her mother's home mathematics strategy but was able to accommodate the change easily:

Sarah: Is the method they use the same?

Ranika: Well with my mum she uses different ones because she was taught in India. But then my dad sometimes shows me a different way but normally it's the teacher way

Sarah: Is it ever a problem that your mum does it differently from the teacher, does that get confusing?

Ranika: Well it's normally not a problem but if it does vary like when we are adding, at school we have to put the remaining numbers at the bottom, whereas she puts it at the top

Sarah: Is it difficult to make that adjustment when you are coming from home to school and doing your maths?

Ranika: Not really, I normally use my mum's way

Sarah: Do you think there is a proper way to do it, the way your parents do it or the way your teacher does it?

Ranika: I don't think there is any proper way to do it but as long as you get to the right answer it's a good way

(White European[9]: school B, year 6, HA)

[9] Ranika was listed as White European on the schools official records despite the fact that her mother is from India. White European is the ethnic group chosen by her parents.

Furthermore, table 17 shows that a good proportion of the children (N=24) found that the help they got at home made the mathematics easier. This was particularly the case for the high achieving children (N=17), who found that parents had more time and were more personalised in their approaches to the mathematics.

In summary, the children's predominantly accepting attitude towards receiving homework is reflective of the historical time in which these children are being educated. All the children in this study had been educated within the context of the National Curriculum, which has homework embedded in its guidelines as part of the learning process.

4.4. Representations of education

Representations of education are the fundamental foundations to many aspects of the child's learning. In western societies the attendance at school and the imparting of particular forms of knowledge to individuals in the 'childhood' years has become unquestionably accepted. Rarely are we forced to question why we send our children to an institution like school. School is, after all, a relatively new phenomena when viewed from a historical perspective. Kessen (1979) wrote about the child as a cultural invention and that the study of children is it itself a different type of cultural invention which did not exist prior to the late 1800s. Up until the 1800s in British history, young children had been expected to work, as adults did, until the Factory Act of 1833 was introduced for the protection of children from exploitation. It was at this point in history that school began to

feature more dominantly in the everyday lives of children (Das Gupta, 1994). Given that the concept of childhood and the child's participation in school is a relatively recent phenomena, historically speaking, this part of the chapter seeks to explore how representations of education are understood in the present.

4.4.1. Parents construction of the notion of education

Parents were asked two questions, which sought to shed light on their representations of education: (i) what does the word education mean to you? What do you associate with the word education? And (ii) what does the word *school* education mean to you? Explain to me what you think *school* education is about.

The answer to the first question posed to parents produced a universal response from this sample of participants. Parents were in no doubt that education was about learning, or the transmission of knowledge. Learning was seen on an academic and social level, and education was considered to encompass a great deal about life skills. The parents' representations of 'school education' were somewhat more varied, however. Understandably, school education was often linked to a subject-based discourse about English, maths, science and so on. Location was one of the aspects mentioned by the parents when trying to put across their definition of school education, as it was about moving outside of the house, being placed in a different building under the control of specialised teachers. Some of the parents could be quite defensive about the fact that they also considered the home community to be an educational environment and that the children learnt a good deal at home as well as school. Dima's mother (Mixed

heritage; school A, year 2, HA) described life at school as 'regimented' after working as a volunteer in a local school. Monifa's father (Black African; school A, year 6, HA) used the words 'controlled' and 'restricted' when referring to school education. The parents who held similar views to these were the ones who promoted learning through play as the ideal educational scenario.

Source: education and life skills

For many parents education was not confined to the academic realms of life. Some felt that school education did not equip children with 'life skills' such as moral development or people skills. Here is a quote from James' mother that illustrates this point:

> James' mother: As Christians as well, we talk about God and our spiritual input and what we believe...being true to himself and being true to what he believes is very, very important. And not lying, and about being kind to other people and the way your react to other people...
>
> Sarah: It sounds like his moral development and all of those kinds of things are just as important as the academic [side] in your family?
>
> James' mother: Definitely, definitely, definitely. **This is about him becoming an adult who can rightly take his place in society, and that's got lots of aspects to it, not just he comes out with A'levels or O'levels[10] or GCSEs or a degree.**
>
> (White British: school A, year 2, HA)

[10] O'levels refer to the end of school exams at 16 years of age and are now called GCSEs

It is not true to say that James' mother considered moral development as super ordinate to academic learning but she did consider that these kinds of life skills were an important part of educating a child for future life. Earlier in this chapter it was reported that this parent sometimes felt that their Christianity created conflict with James' teacher because of the struggle to maintain Sunday as a day of rest, and therefore not a time to do homework. Clearly though, moral development is closely tied in with the families religious identity.

This quote from Rajesh's mother is another example from a parent who sees education as a life skill. However, she refers to a very different kind of developmental life skill, other than moral:

> Rajesh's mother: Cos the thing is right, **as long as you've got the gift of the gab**, you can get further like, **and you know a bit of maths**, you can get further. If you don't get an education that's fine, but as long as you've got the gift of the gab, and maths, you can go places I reckon.
>
> (Indian: school A, year 2, LA)

The kind of life skill that Rajesh's mother mentioned has its basis in the layman's belief that to succeed in the adult world one must be equipped with 'common sense'. Her reference to the 'gift of the gab' is a colloquial saying associated with 'streetwise' talk. This is the kind of skill, which is not related to school-based learning.

This section has addressed different types of life skills mentioned by two different parents in this study. What they have in common is an understanding of education that continues past childhood and into adulthood. The next section explores how parents used a projected future for their child as a source for understanding the meaning of education.

Source: projected future

A strong element to parents' representations of education centred on education as a mediational tool for the projected future of the child. Education, if it is 'good', was seen as the key to a good job, money and independence. Even though parents stated education was about learning, the acquisition of knowledge was by no means considered to be the sole reason for going to school. Education was nothing, if it did not serve as a purpose for the future:

> Rajesh's mother: Learning, learning about things, isn't it? It's just like education is a starting point for me, what he learns now will help him in the future, isn't it? ...If he gets a good education it's a good step for him in future so he [can] decide what he wants to do, isn't it?
>
> (Indian: school A, year 2, LA)

The onus on the projection towards the future, coupled with issues to do with child development meant that for Rajesh's mother, the value of his education did not correspond with that of school as an institution. In this next quote his mother reiterates her claims to understand the British education system having been

through the system herself, which served only to support her established representation of education:

> Rajesh's mother: Well school education, **I was born here and I've been through school**, some of the things aren't relevant to future life but you know like, you go through everything and you do your school education and you get through. I think most of it's about learning the basics and everything and having, because some of the things you do in school don't really help you in future life. I'm not being rude or anything but they don't do they? Like these percentages and history and all that, you're not going to go for a job and say 'oh what's history gonna do or geography gonna do for you?' do you know what I mean? That's how I feel, some of them like English and maths are very important because they help you in everything but like the other subjects are, RE is good because he gets a basic knowledge of everything around him, all the other languages, what they learn, their religion and stuff, that's good. But like history, geography, physics, well I suppose physics is important, not now, further on, at the moment it's just all play for him really. So English and maths, which I think is really important for him.

When asked what her hopes were for him she replied:

> Rajesh's mother: Just basically so he can earn a lot of money and enjoy his life. Unlike my husband [who] says 'you've got to be a doctor' and all that and I say to him 'look, don't bombard him with stuff like that right, whatever he wants to be'...I'm just saying don't be a factory worker like

> me, to be honest, that's all I'm saying to him. Get an education...anything that's good money and that he enjoys
>
> (Indian: school A, year 2, LA)

On the one hand Rajesh's mother projects a future for her son where he has a good job, and lots of money. However, there are some aspects of his academic life at school, which she is unable to represent as helping towards this future, like learning about history or geography. Her lack of understanding about the applicability of these subjects means that she is unable to envisage them in her son's future projection. Only one other parent spoke about similar kinds of issues to do with the kind of subjects they teach in school. Louise's father (White British: school A, year6, HA) considered that art and religious education were not a useful part of the curriculum.

The interview with Dale's parents also conveyed messages, which showed they devalued striving for academic achievement through education. Although his mother and father were extremely keen for him to do well, the following quote reveals how, perhaps subtly, they may be sending out negative messages to Dale about his projected future:

> Dale's mother: I'm not trying to say that education isn't important, it is important but it's not the be-all-and-end-all. University, I interview for my work and sometimes, I'm not saying all of the time...but sometimes the degree educated members of staff are nowhere near as good as the ones who

have got the basic 5 O'levels, you know. Education doesn't always equate to the best

Dale's father: I've never understood why someone who's got a degree it suddenly makes them a better person so he must be good, why?

Dale's mother: I mean at the moment he wants to join the army but that may well change in a few years time but we will be encouraging him to work towards where his ability lies. If his ability is in sports and that type of thing we'll push him towards that, you know. Why set the kid up to fail?

(White British: school A, year 6, LA)

It could be suggested that Dale's parents' expectations are already low. On the other hand, the continued frustrations they expressed to me from having a low achieving child may have created a projection for the future, which they felt realistically reflected his current levels of achievement. This is in contrast to Sumana's mother, whose drive to promote the value of education matched her ambitions for her child. Sumana's mother was determined that her daughter should strive to undertake a profession:

Sumana's mother: I always say to them 'what do you want to be when you grow up' and I put into their heads 'you're gonna be this and you're gonna be that' but it does give an idea...I try to put it into their head, this is what profession to go for so they realise that yes, I need to do this so that I can become that. So it makes sense to do all this education, what's it for, you know?

(Indian: school B, year 6, HA)

More issues surrounding projected futures are discussed in chapter six when the concept is explored in relation to parents' past experiences.

Source: child development

Not surprisingly, age related discussions arose for many parents when they were asked to describe their representations of education. Like the construction of child development in relation to achievement, there was some variation in their age-related representations of education. Once again, Rajesh's mother revealed one of the most disparate notions of education when linked to the source of child development:

> Rajesh's mother: I think really education starts from when he's eleven, you know...I think at the moment it is good but it's a bit easy, innit[11], until he goes to juniors he's just basically easy learning innit? Which is all we're doing because we're not forcing him to like get really into it, just let him carry on at his own pace and see what he thinks of it...I am interested in his education and all that but I don't, I think he's still a kid...I think when he gets to about ten or eleven then he'll start telling me more as well
>
> (Indian: school A, year 2, LA)

For this next parent, representations of education spans a much larger age of development; but she recognised learning as a life-long issue. To placate any

[11] The term 'innit' represents the words 'isn't it' and is adopted by some local people as part of their dialect

developmental confusion over learning she separates learning into 'formal' and 'informal' to help her reconcile learning in both communities of home and school:

> James' mother: Learning, particularly in your younger part of your life but obviously it's not exclusively so...I mean, school education I think is the more formal side of education for, obviously a young person, up to the age of about, and obviously between the ages of about five and eighteen so it doesn't sort of formally really start until they're five
>
> (White British: school A, year 2, HA)

In a different vein, Jennifer's mother believed learning begins at a young age, but that the type of learning young children should be engage in is play-based:

> Jennifer's mother: I still think at seven they should be learning through play really. I mean in a lot of countries they don't even start school until seven so they should be learning through play
>
> (White British: school B, year 2, HA)

Note from the above quote that this mother classifies her own child as 'young', which is a representation of child development that is quite different from the institutional one of school.

Source: job role

Having knowledge about the world of 'education' proved extremely useful for some of these parents. Being a teacher, classroom assistant, governor or having a

member of the family who was a teacher meant that some parents had access to information that other parents were unaware of. James's mother told me:

> James' mother: Having Martin [her husband] working in education yeah, definitely does [help], and he knows people who know people. Now one of the reasons why we got on so well with Mrs. Davey last year, which a lot of parents don't, was because Martin used to teach her son. And Martin used to work with her husband at Netherfields...I'm positive that one of the reasons why we've had a good experience with Mrs. Davey, and some of the other parents didn't, was because of that level
>
> (White British: school A, year 2, HA)

But there were also negative aspects of having a husband who was a mathematics teacher. Catherine, as James' teacher, had put him under the low parental involvement category because his homework sometimes had errors in it, which she was more critical of because his father was a teacher. However, parents with educational job roles had greater awareness of where to get information as well as access to sources like the Internet and books. They tended also, to be more creative at home with the kinds of practices they undertook.

Two issues were notable about parents' representations of education, particularly when related to school education: (i) for these parents, education was about more than academic learning and (ii) education was an enduring process needed throughout life. The extended representations of education, beyond academic learning, such as moral development and other life skills have been noted in

previous research in relation to cultural representations of learning. Placing an emphasis on the moral development of the child was something Gallimore and Goldenberg (2001) reported in their study with Latino parents in research on home literacy practices. For these parents, bringing up their child to be a good person, to know right from wrong and to respect others was their primary responsibility. Teaching their children literacy was traditionally considered the responsibility of the school.

Parents' representations of education as a life course trajectory indicates that they see learning as an ongoing process. This may be linked to the former point made here about life skills and moral development. Using their symbolic imagination, parents begin to project an image of their child as a future adult, and that future encompasses the whole context of the individual. Parents foresee their children being successful in all realms of their lives: emotionally, socially and academically.

4.4.2. Children's construction of education

Certainly in western countries there is a dominant representation that the transmission of knowledge is primarily the domain of school during an individual's early years of life. However, it is often taken for granted in the adult world that children understand why they need to be at school. Understanding why we need to be educated is a fundamental representation for future success. So why did children think they needed to go to school?

The reasons that the children gave as to why they needed to go to school were generally very different depending on their age. The year 6 children (aged 10/11 years) had more clarity about the usefulness of education than their year 2 (aged 6/7 years) counterparts. In total, thirty year 6 children were interviewed and twenty-four of those said that education led to a good job, and many mentioned having lots of money within this answer. Three of the year 6 children said that a good school education led to university and the remainder mentioned generally learning about the world in preparation for adulthood.

In contrast, only four of the twenty-two, year 2 children mentioned getting a job in adulthood as a reason for going to school. Four of these children didn't know why they had to go to school and the remainder of the year 2 children knew that they were there to learn, but could not elaborate on why it was important to learn.

It is interesting that by the time the children reach year 6, they have begun to understand the 'consumer society' and have been socialised into understanding that education is the currency. It is a seemingly simple equation that education equals more money, which equals more goods.

4.5. Discussion

In the exploration of the dominating meaning constructs evoked by parents, teachers and children, a complex set of understandings about the educational world of the child has begun to emerge. Vivid misconstructions between the home and school community are revealed particularly well through the notion of

achievement between the teachers and parents in their careful discussions about the child. When seen in the light of parents' representations of child development, the construction of achievement from a developmental perspective is transparent. Parents' reliance on the child as a mediator of information between the home and school community proved equally fallible, as children showed themselves to be active participants in the communities to which they belong. Children have the power to withhold information, present a misunderstanding of either communities or indeed themselves. This is particularly poignant given that so many parents used their child as an emotional indicator that school was going well.

Teachers' disparate expectations on parents, particularly with respect to their involvement in homework has made it very difficult for parents to interpret what they need to do at home with their children. Once again, the teachers' prevailing representations of expectations of parental involvement was influenced by changes in development from an age-based perspective subscribed by the school. This is problematic on two levels. Firstly, parents have their own representations of child development, which do not always mesh with those held by the teachers. Even then, the representations as the child progresses through the primary years will change. Added to this, are the many different expectations held by teachers within the same year group. Secondly, age-based representations of development are particularly deleterious for the low achieving children, who sit outside the realms of this institutional construction. Rajesh's mother (Indian; school A, year 2, LA) was a particularly pertinent example of a parent whose own representation of child development, and the expectations of achievement for her son's particular

age group, were so different from the school community. This mother's representation of child development is arguably cultural and influenced by her belonging to a particular ethnic community. Development is suggestively a cultural construction (Kessen, 1979; Walkerdine, 1993) that is reshaped by society, the individual and communities to which we belong.

The analysis on children's own representations of achievement and mathematics revealed that the children did not always have a realistic understanding of their own success in learning. This was particularly visible in the low achieving classroom of school A (year 2) whereby the children's confidence and enjoyment of mathematics was very high. This may have been the consequence of Jane's teaching technique, in that the children were continually praised for their successes. At times, high achieving children felt quite insecure about their achievement in mathematics at school and had a slightly higher tendency to compare themselves with other classmates.

Finally, the children's discourse surrounding homework revealed that as a meaningful construct, homework was fully embedded in children's representations as a positive tool for school and home learning. This is indicative of a construct, which can be viewed through a particular historical lens, which is not necessarily shared by the parents or teachers of a different generation. Only one child revealed a prevailing construct of homework as a negative activity, which was obviously from the home community. At the same time, distinct differences in the children's representations of homework and mathematics in

general began to emerge between school A and school B. In general, the children in school A were more positive about their homework and mathematics learning at home. There appeared to be less conflict of mathematical practice, particularly for the ethnic minority children in school A, in the transition between home and school. Despite the fact that the number of ethnic minority pupils in the mainly white school (school B) were much fewer, the majority interviewed for this research described their parents home mathematical practices as more confusing. This presents a new research question: what is it about the multicultural classroom, which makes it easier for the children to accept difference in mathematical practices in the transition between home and school?

The next chapter will explore issues of identity as they are represented in the transition between the two communities of practice, home and school.

Chapter five: Exploring issues of identity construction between home and school

5.1. Introduction: analysing issues of identity

This chapter explores the notion of identity as it is represented through participation in communities of practice. With the onus on learning, identity is formed in the process of 'doing' while making the transitions to and from different communities. At the root of these transitions are the social and cultural experiences of the individual. This chapter investigates how children, teachers and parents make sense of who they are using two different types of analysis: (i) the exploration of identity using data from the child, teacher and parent interviews and (ii) an analysis of identity using the child identity task. In the first half of the chapter a child case study and teacher case study will be the focal point around which to discuss identity. The analysis of the parental identity will draw from a number of the ethnic minority parents interviewed as part of the study. Ethnic minority interviews were used in this chapter because this helps to pinpoint key issues that are lost when a broader focus is drawn upon or when there is a mixture of ethnic minority participants, like in the previous chapter.

The case studies in this chapter will draw on three levels of identification to help and understand the process through which identification adapted from the work of

Abreu and Cline (2003). Those three levels of identification are; i) identifying the other; ii) being identified and iii) self-identification.

i) Identifying the other – how the individual comes to gain an understanding of the social identities of 'others' that are given by society.
ii) Being identified – how the individual comes to understand the identity extended to them by 'others'.
iii) Self-identification – how the individual comes to internalise and take positionings in relation to identities that had previously existed in the social sphere.

The second part of the chapter will explore and analyse the narratives from the child identity task described in chapter three (section. 3.2.6.). This analysis also uses the three levels of identification described above to examine how the experiences and representations of the family, teacher, friends and the self are influenced by high or low achievement in mathematics.

5.2. Identity and the child: the case of Monifa

This part of the chapter will examine the way Monifa, the daughter of a Black African (Nigerian) family, constructs her identity as she makes the transition between the two communities of home and school. Monifa was chosen for the purpose of this chapter because she was a child who was able to clearly articulate the role of significant others in her life. The excerpts below give some indication about her own representations of self-identification and the identification of

others, and how others identify her in the every day relationships she has with her parents, teacher and classmates.

Monifa was a high achieving child in School A, year 6[1] aged 10 years old. Her father was a 40 year old I.T. consultant who was in the process of producing an interactive mathematics website marketed at schools. Her mother was self-employed and in the process of starting a new business as a party organiser. Both parents were educated to degree standard. The parent interview was conducted with her father at his place of work and Monifa, like all the other children, was interviewed at school. Monifa's father had lived in Britain until he was seven years old, when his family had returned to Nigeria for the rest of his school education. He later returned to Britain as an adult. Monifa was born and educated in the UK and was the oldest of three siblings. She told me in her interview that at home with her parents and grandparents she spoke English and Nigerian.

Monifa described three significant communities in her life: (i) her home community, which mostly revolved around her parents, (ii) her school community, that revolved around her teacher and (iii) her friends, who physically crossed over into both the home and school community. Two dominant representations emerged within the context of her descriptions of these communities and they were achievement and culture. This part of the chapter will reveal that teachers, parents and friends all contributed to the ways in which

[1] Monifa's mathematics teacher was Anna

Monifa experienced her notions of achievement and culture. Monifa's case analysis will begin with her 'identification of the other'.

5.2.1. Identifying the other: the role of parents and classmates in the construction of achievement identity

'Identifying the other' allows the child to construct meaningful representations which may eventually become reflected in their self-identification system. For example, Monifa used descriptions of her classmates as markers for understanding achievement and she was very much aware of the positioning of herself and her classmates in terms of mathematics performance. The next quote is interesting because of the different attributes Monifa bestows to her classmates. In the interview I was able to explore in more depth how Monifa had come to identify her classmates in the way she had. The answer resides in the way in which she interprets their home communities:

Sarah: Some children do better at maths than other children. Can you tell me why you think those children are good at maths?

Monifa: Well, like Chiranjiv, who's the best person in maths, he gets it from his sister. And Ryan was just born naturally with it, so it just depends really. Some people are just born naturally, some people get it from their parents

Sarah: So you see some people as just having natural ability, and you mentioned Chiranjiv getting help at home. How did you know Chiranjiv got help at home?

Monifa: Cos, like he, he like boasts about it. And he keeps on saying that his sister in high school was the best person in the class and everything like that, you know, so he tells you

Sarah: And Ryan you think would have more of a natural ability?

Monifa: Yeah

Sarah: What gives you that impression?

Monifa: Because he doesn't talk about his family a lot really. And he doesn't say, like he just, he doesn't really talk about family. I think he was born with it naturally, really, cos none of his family don't seem to, they don't like, maybe he did get it from his family but they don't really show it

Sarah: So he doesn't seem to have a lot of help at home in the way Chiranjiv does?

Monifa: Yeah, cos he keeps on saying he does it by himself and he likes maths and everything like that

Throughout Monifa's case analysis it will become evident that she placed a great deal of value on the home community as an influential aspect of her success in learning. In the following quote Monifa describes how parents must fulfil the child's needs to contribute to the child's success in mathematics:

Sarah: Some children have more difficulties with their maths. Why do you think those children aren't so good at maths?

Monifa: It's either, well this is my own personal view, it's either that their parents don't really look after them at home.

The quote above reveals that Monifa extends classmates' failures to their parents. Ryan's description of his home community is most dissonant from her own beliefs and contradicts her previously held representation about the requirements of home support for success in learning. In order to reconcile this contradiction of presentation, Monifa resorted to beliefs about innate ability to help her understand the phenomena of his achievement. As the interview progressed it appeared that she attributed her own academic achievements to her family. The strength of her representation about the positive role of the home community is brought about from her identification with the other, in essence, the identification of her family. The next quote paves the way for revealing this aspect of her representations:

> Sarah: Does anyone in your family help you with your maths homework? Can you tell me?
>
> Monifa: My dad and my mum. If my dad isn't there then it's my mum and if my mum isn't there it's my dad. But if both of them aren't there then I either ask my aunt or my uncle, because **nearly all of my family are good at maths** so I always have somebody to help me

Elsewhere in the interview, Monifa showed an awareness that her school performance in mathematics was also very positive, but used her grades on tests to understand her achievement in the school community. The explicit reinforcement from home is much more powerful in helping to inform her identity as a good mathematician than the secondary reinforcement that occurs at school. Furthermore, Monifa has been able to internalise the positive representation of achievement at home. This is partly possible through her ability to understand the

'practical like' mathematics skills evident within the household. The next quote reveals the connection Monifa made between her mother's work practices as a party organiser and the mathematical skills required for undertaking the practice:

> Sarah: How do you think maths can help in your everyday life, can you describe ways that it could?
>
> Monifa: A lot of things. Um, like, if you were organising a party you would have to say how many things you need or how many litres of this you need so you can calculate for each person how many things they're going to have and how many things the other person is gonna have.

Monifa had used the explicit job roles of her own parents to inform her understanding of mathematics as an everyday practice. In fact, she explained that one of the things she most enjoyed about mathematics was the practical use that can be made of it outside of the school environment.

It is possible to see from the outset that Monifa is able to establish her identity as an achiever using the identity of the 'other' to help inform her. At this juncture it is her parents and classmates who she uses as sources for understanding achievement. Her identification of her home community as successful has such strength that when faced with representations of home learning from classmates that contradict her own she turns to explanations of innate ability to help her understand.

5.2.2. Identifying the other: parents' and teachers' practices perceived as originating in cultural identities

This section will describe Monifa's representations of her parents' and teachers' practices using culture to explain the identities of 'others'. Monifa openly described the cultural divides between home and school brought about by what she perceived as the power struggles between the teacher and her father. Although neither the teacher nor her father mentioned this episode to me, it clearly had a significant impact on her. She initially began talking about differences in mathematical practice between home and school, but as the narrative progressed it transpired that she believed conflict existed in the relationship between her father and teacher:

Sarah: Does your dad explain it [mathematics] in the same way your teacher does? Are there any differences?

Monifa: My dad explains it very differently actually. Like the teacher explains it so everybody can understand but because my dad knows me, cos we're father and daughter, he explains it to me so I can understand it properly, so it's better for my dad to do it

Sarah: Is that because over the years he's understood what works for you?

Monifa: Yeah

Sarah: Are the differences in the way he explains it, in the words he uses, or in the strategies he uses, both?

Monifa: Yeah, because I figured that out one day when Miss Durham and my dad, I don't know why but I don't think Miss Durham is too keen on my dad any more because once when I took my homework to my dad I told

him that Miss Durham said this, and that this is how you do it, and then my dad said 'no, that is completely wrong' so when he told me it then I understood more. But then when I took it to Miss Durham, Miss Durham said 'no, your daddy's wrong, that isn't how you do it. You can go and ask my husband in the high school'. And I wasn't too keen but I understand my dad's more so I went with my dad. But she's my schoolteacher in school, so.

Sarah: Does that sometimes cause a bit of, I don't know whether you know this word, but conflict. That you sometimes find it hard going forwards and backwards with that?

Monifa: Yeah, yeah

Sarah: Which do you think is the proper way, the way your dad does it or the way the teacher does it?

Monifa: I don't know. Sometimes they just explain it differently but it's the same because, well I think it's the **different ages.** Because my dad would have done it differently and it's where we come from because **my dad was taught in Nigeria, and he taught in Nigeria.** And Miss Durham has been here so. They do it in different ways. But my dad teaches it so I can understand even though, sometimes I don't understand him because he's been taught in Nigeria

Monifa uses a number of different identity markers to understand the divide between her home and school communities when it comes to mathematics learning. Initially, Monifa identifies age differences as the reason for the disparity between her fathers and teacher's numeracy practices, but she also draws upon cultural issues to make sense of the relationship between her father and her

teacher. That relationship resides in Monifa's representation about who has the greater ownership on the mathematical knowledge in terms of the hierarchical positionings of these two important figures. Subsequent to this episode in the interview, Monifa frequently returned to culture when reflecting on her home community. When I spoke to Monifa's class teacher, Anna, about the different strategies that children brought from home, the scenario that she presented to me was very different from the one Monifa describes above:

> Anna: I think with the top maths set as well, especially if we have some children whose parents are very keen on maths because, they tend to always have their homework done and they will say; if I say to them 'so how did you work that out?' often they'll say their way or whatever and they say 'but my dad showed me another way', we do have that. It does tend to be in my set with Maneesha, and her dad is a maths teacher. And who else, Monifa, who has a maths tutor so it's other mathematicians I suppose who are showing them different ways 'oh yeah, you can do it that way but here's another'. **And so I never dismiss it** and say 'lets see how Maneesha's dad has done it and have a look at it'. **And if they've understood that, then that's fine**

Anna believed that Monifa had a mathematics tutor but neither Monifa nor her father mentioned a tutor in their interviews. Furthermore, in the next quote from Anna, she mentioned an uncle who helped Monifa with her mathematics but again, this was not mentioned by Monifa or her father. It appeared that in this respect, Anna's account of Monifa's home mathematics learning was incorrect.

But the tension between the home and school community relationship revealed itself in a minor way through Anna's description of Monifa to me. The teacher seemed reluctant to praise Monifa's mathematics skills even to me, and quickly moved on to talking about other children after this brief description:

Anna: Yeah, she, her uncle tutors her. But she did come in with a GCSE[2] book and we sort of thought, 'well not quite at that standard Monifa' so how much the uncle's actually helping or, I don't know. And I would have thought that he could be giving parents false hopes

Sarah: Do you have their mock SATs scores?

Anna: Yes I have

Sarah: How did Monifa do?

Anna: Monifa got a level five[3] and she got a total of 81

When taken in the context of the whole interview, and comparing the teacher's descriptions of Monifa with her description of the other children, it seems that Anna redirects the conversation away from Monifa very suddenly. It may have been that she didn't want me to share the same perception of Monifa's achievement that she thought her family held. This is despite the fact that Monifa is clearly very successful in her mathematics examinations. To acknowledge Monifa's success at school would be seen to support home learning to the same extent as school learning. Moreover, there is an accepted construction of the level of knowledge a child in Monifa's age bracket can master. If the child is beyond

[2] GCSE is the level of attainment reached at sixteen years of age
[3] Children in year 6 are expected to achieve a level 4 (mark range 45-75) in their SATs examinations

that level it could create conflict for the teacher because it challenges their own established social identity and the status that comes with knowledge. It must be mentioned however, that neither Anna nor Monifa's father spoke about any incidents of conflict between them. Monifa's father gave no indication that there was any tension or negativity between himself and the teacher.

The important point remains the fact that for Monifa, there was a 'gap' between the home and school communities of mathematics practices, which she attributed to culture. Her father's upbringing in a different country impacted on the way Monifa learnt mathematics in the home, and supplemented and sometimes contradicted the mathematics learnt in school. But the tension between the home and school becomes more than the difference in mathematical strategies for Monifa, as she extends to her teacher and her father cultural identities which are at odds. Perhaps the tension is so powerful for Monifa because, as previously mentioned, she identifies strongly with the home community and the positive notions of achievement surrounding the home. However, in the context of the educational world of the child, school is the focal point for academic learning and according to societal representations, the teacher is granted heightened status.

5.2.3. Identifying the other: the role of friends in the bridge between home and school community

Out of all three key figures in the home-school relationship it is the child's friends, which are most likely to physically transcend the home and school community to the greatest extent. The social world of the child can be an isolated

and exclusive domain, which parents and teachers find difficult to access. Monifa explained the extent to which parents and teachers are excluded from childhood and the impact this had on her. Monifa illustrates the powerlessness she sometimes felt at school:

Sarah: Do you like school? Can you describe to me why you feel that way?

Monifa: Um, in some ways I don't and in some ways I do. Cos, I do because I get a good education and I'll be able to do things later with my life. But in other words, at school, if things like happen to you in the playground teachers can't do anything about it. And neither can your parents. Our parents, all they can do is tell the teachers and the teachers can only tell their parents. And most of the parents don't really do anything about it.

Sarah: So you like the learning side from what I can gather?

Monifa: Yeah

Sarah: But the friends and social bits of life, can they be quite difficult at school?

Monifa: Yeah, cos like, on the playground nearly everybody they pretend to be good in here, where the teachers are, but outside they're really not nice people. Cos you get to know them, cos like, you're around them and they start bullying you and things like that

The peer relationships in the playground are one area of school where neither the parents nor the teacher have a monopolising influence over the children. In chapter six the relationships aspects of the child's learning, like bullying, are significantly represented throughout many parents' discourse. Parents described how protective they felt in relation to this element of their children's school

education. However, as Monifa would have it, parents are virtually excluded from the relationship side of the educational world of the child.

In some ways Monifa actively sought to keep the social side of school life very separate from her home life. Again, Monifa considered that the divide between home and school could be attributed to two interlinked cultural factors, (i) her parents were both from Nigeria and (ii) they did not physically shared the experience of school that Monifa was experiencing:

Sarah: Do you think your parents understand, not just about your learning in school but your general life in school, do they understand what it's like with friends and things like that?

Monifa: I don't tell them. I don't speak about stuff because what happens, like me and my friends we're able to talk about different things like things that we both experience. But my mum and dad, cos they're from Nigeria, and they've been brought up in a different way so it's different. So I can't talk to them about most things, I can talk to my friends about most things because they're not like my parents, my parents would be able to tell me 'can't do this, can't do this' but my friends they can't do that. They're just your friends and they're there for you

Sarah: Who would you most likely talk to?

Monifa: It would be friends at school. Sometimes, it just happens and my mum just asks me 'how come you never talk to me' and I just say 'well you're my mum' but then she makes me talk and everything. But I make sure I don't tell her most things

Here, Monifa has another identity impacting upon her, which is related to her membership to a group of friends who are in the same age bracket. Her opinion about her parent's involvement in her friendships shows that she deals with difference by making it a cultural construction. The following quote brings to light the fact that while her affiliation with the home community is strong in terms of her academic learning, this is not the case of her social side of school life:

Sarah: Do you think your mum and dad liked school when they were at school? Can you tell me about it?

Monifa: My dad hated school cos they picked on him because he was short and in Nigeria it depends how tall you are to be a prefect, but my dad was quite short so they would just bully him and everything. And he would like stick up to them and he would call them names and everything. And when I get bullied at school he tells me to call them names if they're bad to me but I just tell dad that it's different; and to stand up to people. Cos in Nigeria you have to stand up for yourself, like the teachers don't do anything at all but here it's different because you can tell the teacher and they'll tell that person off and they won't bother you again. But sometimes it doesn't work out that way but I don't want to call them names cos if it was me I wouldn't like to be called the names so

Sarah: So you can't use the same thing your dad did?

Monifa: No

Sarah: Do you ever ask your mum and dad about their school days?

Monifa: I do, like mostly it's because when I get bullied, I asked them what they did, how they felt when they were young, and how they dealed *[sic]* with

things. But my dad and mum get into fights because of this. They get really angry at each other and start arguing

Sarah: What, over what you should do?

Monifa: Yeah, cos my mum says that I should tell a teacher and if they don't listen to me then she'll go over to the school but my dad says that, that would do nothing and that I should call them names or something like that and they'll just leave me alone

Very often in home-school policies and psychological research on home-school relationships there is an assumption that the home community holds a united representation about the child's education. Monifa's quote demonstrates that parents can display quite conflictual understandings of life at school. Her mother as Monifa described it, has a more consonant opinion with the school. Monifa attributes her father's opinions about bullying to his upbringing in Nigeria. In fact, her father's attitude could relate to either gender ideals or an upbringing from a particular historical time.

There are means by which children can bridge the gulf in the relationship side between the home and school communities. In this next quote, Monifa attempts to draw together the cultural divides of home and school by allowing a particular friendship to make the transition into her home community. The last line of the following excerpt indicates that 'understanding her parents' would require in the friend the same cultural shifts as it does for her, when making the transition between home and school communities. The mediational bridge between these

two communities appears to have been joint attendance at church, a third type of community:

> Sarah: Do you go to any classes or clubs outside of school? Can you tell me about it?
>
> Monifa: Um, well I do and I've invited one friend to our church on Thursdays so we can know each other well, we go to the church and play basketball and things like that, and we do relay race. And it's better because we can socialise with each other and I can bring some friends over and they know some of my friends. **And they start to understand my parents and everything like that**

The world of relationships for the child can at times either increase or decrease the gap in the cultural communities of home and school. In identifying the negative aspect of the other, Monifa is establishing the playground as a third type of community, which for the most part excludes the parents and the teachers. Friendships offer the means by which the divide is reduced if she chooses to share her participation in the home community with her friend. Equally, there may be some friendships, which she may choose to deliberately exclude from the home community. Monifa assumes that her friend will also need to make changes in her cultural representations to cope with access to her home community.

In discussions on 'identifying the other' it has emerged that Monifa's parents, teacher and her classmates have contributed to her reflections on issues of achievement and culture in others. At this juncture in the chapter it is unclear how

this has yet to contribute to the evolution of her own social identities. Therefore we turn to the next level of the identity process 'being identified'.

5.2.4. Being identified: the role of parents and teachers in the extended identity of the child

Duveen's (2001) proposal[4] that self-identification first begins with an identification with the community is evident in Monifa's extended identity as a mathematics achiever. As described at the beginning of this chapter 'being identified' is a process whereby the individual comes to understand the identity extended to themselves by others. It will become increasingly apparent through this section of the chapter that the home community appeared to play an influential part in her representation of achievement. Monifa used the roles of significant others to understand what achievements she needs to accomplish for satisfaction in her adult life. She identifies with certain jobs and excludes others (like being a builder) as requiring a certain standard of achievement. The following excerpt indicates how she has reflected on this identity extended to her by her parents, although revealed in the quote are the contradictory messages received from her mother and father:

Sarah: Do you know what you would like to do when you grow up? Can you tell me about it?

[4] Duveen's work is discussed in chapter two

Monifa: I was gonna be either a singer or I would be doing computers and like a business where I would be doing computers and all that. Because my dad has really taught me so I understand a lot, so that's what I would be

Sarah: Do you know what your mum and dad would like to see you do? Can you tell me about it?

Monifa: My dad wants me to do computing and my mum wants me to be a singer. And like my mum is saying that she wants me to be in a choir and all that, but my dad wants me to stay at home so he can teach me a lot of things. And he takes me to his office and all that so

Sarah: So you're piggy in the middle

Monifa: [we laugh] yeah

It is relevant to note that opposing extended identities do not necessarily reside only in the relationship between home and school. Monifa's discourse reveals that within the home there are some conflicting views between her parents. This has consequences for her own and her parents' projected notion of her future. The job identities proposed for her by her parents were quite different, one being artistic and the other academic. Given her strong representations of achievement in other parts of her interview, her father played a more influential role in her learning, as is indicated by the fact that he was the main homework tutor. Certainly, the influence of her parents is strong because she has accepted and internalised the job roles they projected for her and made them her own. This may be taken as a certain point in her personal history and is how she constructed herself at the time.

One of the ways in which the home community as an environment of learning was augmented, was through Monifa's involvement in her father's work practice. Her father's work as an Information Technology consultant required specialised skills in programming which would be inaccessible to most computer users. For example, her father told me that he had taught Monifa some basic programming skills. The next extract reveals how this tutelage impacted on her extended identity:

Sarah: What is your favourite subject? Can you tell me why you like it?

Monifa: My favourite subject, erm, I.T. because I'm around, cos my dad is like an I.T. consultant and all that, I'm around him a lot and he's doing some fuses and things and teaching me stuff. And at school I get to do more things in I.T. than at home, cos my dad's on the computer. So if I get to learn about that I'll be able to get my own website, cos my dad wants me to learn about it so I can get my own website

Sarah: Do you feel, because you're dad's in the job he is, do you feel that gives you a bit of an advantage when you're at school?

Monifa: Yeah

Once again, we see her identification system residing with her father, as her mother's projection for the future is pushed aside. The father cements her identity for the future by developing her competence in the practice of computing at home.

In the construction of job roles, Monifa's parents have extended an identity, which she has then internalised and made her own. In her discourse Monifa has

described the way that conflicts in identity can occur within the same household when parents have different representations of the child's current education, and projection for the future. Research using a sociocultural perspective has not accounted for the divisions between parents in their expectations for their children, and the projection for the success of their child in the future. One interesting observation is that her father's extensions of identities also extended to the activities they did together. Monifa's father tutored her, took her to his place of work and gave her resources that put her in an advantageous position at school. These activities were not evident in Monifa's mother's extended identities.

5.2.5. Self-identification

As previously discussed, Monifa's identification systems centred on her construction of the meaning of achievement. Similarly, that the community which featured the most in establishing this construct was the home. The next quote reveals how she internalised her identity following her association with her home community, and in particular, her father:

> Sarah: What subject do you feel you are best at? Why do you feel that way?
>
> Monifa: Maths, um, because my dad is very good at maths, he was once a maths teacher. And he's taught me a lot, so I know quite a lot about maths. And I get extra lessons on maths, he teaches me at home
>
> Sarah: Your dad teaches you, do you think that helps you in your classroom?
>
> Monifa: Yeah, cos he can explain to me. Because he's my dad it's more personal so he can explain it to me. So that's why I feel comfortable with him. But with a teacher it's different because you don't, like, know them

personally, they just tell you what they have been taught and then that's it. They don't really explain it to you like, like so that you'll be able to remember it

Sarah: Is it, having your dad on your own are you able to discuss things more?

Monifa: Yeah, cos like teachers have to handle about thirty people in one classroom, and it's very hard to go around everyone telling them, telling them this, telling them that. But if it's just one person with another person, then it's easier

The strength with which she described her home gives some indication why her father's input has a pronounced effect on her learning. The fact that her father had the skills to tailor his home mathematical practices to suit his daughter's needs, adds a personalised element to her home learning. But more importantly, her father's confidence in mathematics imparts to her, her own self-confidence:

Sarah: You said that [mathematics] was one of your best ones, how do you know, what gives you the idea that you're good at maths?

Monifa: Because like, when I do it I understand it more, I don't know why. Maybe it's because my dad was a maths teacher and that it just runs through the family because all his family is good at maths. **So I'm just good at maths as well**

The other representation of difference, is that of culture and her father's education abroad. The conflict for Monifa arises because her home practice has a stronger influence on her because she is able to understand her father's methods better than the teachers. But she shows that she is aware that school should be the prevailing

community and this leads to Monifa displaying contradictory messages throughout her interview:

Sarah: Do you think your parents understand what you do during your school day? Can you describe that for me?

Monifa: No, I don't think they do cos it's different from where they've been taught. So sometimes they don't understand because, like if they teach us something and we stick to that, then I stick to it. But then when I get home they ask me 'what have you done at school?' and when I explain it to them they don't understand because of what they've been taught in Nigeria. So it's pretty different, and it's hard for them and it's hard for me because I get mixed up sometimes. And when I like say it in class, they tell me 'what are you talking about?' **I just try and stick to what the teacher has taught me**

Sarah: Do you have to quite adaptable, do you try and be like your teachers want you to be at school and then be like your parents want you to be at home?

Monifa: Yeah, yeah. It's pretty confusing and hectic so I'm just all over the place in my mind. **It's like I'm two people at the same time and it's just hard.**

Sarah: Do you try and take a bit of each thing to make up the person you are in the middle?

Monifa: Yeah

Sarah: Is one influence stronger than the other at the moment?

Monifa: At the moment I think, I'm not quite sure, **I think it's the influence from home that is bigger because even though I am, I'm mostly at**

school, but at home it's different and I know my parents well and so it's pretty complicated.

Monifa is aware of the differences in the demands of the two communities of home and school and created of two identities as a consequence. Monifa was contradictory in the messages she conveys through this quote. At the beginning of the discourse she says she uses mathematical strategies provided by the school. At the end of the passage she maintains home has the strongest influence because of the emotional way she can connect with her parents. On one level her cognitive allegiance is to the school and is reinforced by the fact that her parents were taught in a different country, and therefore use different methodologies. On the other hand, the quote previous to this revealed that she understood her father's strategies better. In essence, there is a conflict here for Monifa on a cognitive level, while her representations of achievement on an emotional level hold her alliances firmly in the home community. Equally, it is left to Monifa to make the mathematical strategies of home and school compatible, when she struggles to do this the solution is to create a separation. It is this situation which may lead her to describe herself as being two people.

The discussions on Monifa's sense of identity have contributed to understanding how powerfully a projected identity, extended by others, influences the construction of self-identity. At times this extended identity becomes a conflictual part of self-identity, but an individual 'chooses' what elements of their extended identity to internalise and what elements to resist. Monifa's choice about what to internalise and what to resist exist on two levels and are interwoven in a complex

way. On a cognitive level Monifa borrows from the home and school community, which has led to her perceiving some tension between her father and the teacher. When addressing academic achievement from an emotional perspective, the home community is more powerful because of the positive representations of achievement in existence. However, when addressing social aspects of her world, it seems Monifa feels very isolated, developing a third community (the playground) that neither parents nor the teacher can truly penetrate. This isolation is increased by the conflict within the household about how she should treat incidents of bullying. Monifa feels unable to draw on her father's own school experiences in this matter, because his methods of dealing with the problem contradict the social values she has learnt in her school community. One must be tentative in the suggestion that an individual has the ability to 'choose' what elements of identity to borrow from their communities of practice and what to resist. The choices available may be restricted by the experiences around the individual. Monifa is fortunate that many aspects of her home and school community life were positive, which enabled her to fulfil her full achievement potential and construct dialogical identities that matched that.

In general, the analysis of Monifa's interview has shown that the process of identity development can be reflected in the three levels of 'identifying the other', 'being identified' and 'self-identification'. The next section of this chapter is going to focus on the same processes in a case study with a teacher.

5.3. Identity and the teacher: the case of Shazia

This section of the chapter is going to focus predominantly on Shazia, the year 6 teacher from the pilot school. Her interview has been used to understand issues of teacher identity because (i) as a fourth-generation immigrant in this country her experiences may echo those of the children in a multiethnic classroom (ii) she was the only ethnic minority teacher interviewed[5] and (iii) she reflected deeply on cultural aspects relating to identity[6].

In order to maintain theoretical consistency this part of the chapter will follow the same paradigm used for the child interview: (i) identifying the other, (ii) being identified and (iii) self-identification. The interaction between these three concepts is very pronounced in Shazia's interview, so in some sections they have been combined.

In the previous part of the chapter, Monifa recalled the difficulties that arose for her when the expectations and practices of home and school did not match, and the multiple identities she formed as a strategy to help her cope with the transition between the two communities of practice. Shazia's reflections on the parents of the children she taught, and her own experiences as a child and a parent, give some indication how children like Monifa may subsequently develop their identity into adulthood. In the early sections of what is to follow, Shazia's discourse

[5] Shazia was a member of the Pakistani Kashmiri community (see chapter three for her profile)
[6] The pilot school had a high proportion of South Asian pupils and the comments she makes throughout the interview refer specifically to this ethnic group

centres around her description of the 'other', and the identities she affords the parents of the children she teaches. As the interview progresses she is able to relate her own identity as a child growing up in similar circumstances, to the children she now teaches, and the changes manifested in her practices at home with her own children. At the same time, other elements of her cultural identity remain stable and her cultural alignment with the Pakistani community continue to be cohesive.

5.3.1. Identifying the other: the parents of the children

In view of the above, it is relevant to start by looking specifically at the ways Shazia identifies the 'other', and the mediational role that culture plays to help her cement her notion of parental identity. As part of the interview I asked Shazia to comment on the role of culture in the home/school relationship:

> Shazia: Again, it goes back to that parents...I don't think it's a conscious thought, I don't think it occurs to **them** to think like that. I think sub-consciously it's not a top priority to have an influence in the school. Well since, I've been working here close to eleven years now, and I do know before I started parents' evenings were very rarely attended, we now have literally almost a hundred per cent attendance' for parents evening. And that mostly has to do with the fact that we now have dual-language staff. We have community language staff. So parents are far, far more comfortable with coming in... I know some schools translate literally every document, but saying that the same thing happens because they're still, the parents who can't read English, usually can't read Urdu either, so it's

> a bit pointless. The ones who can read Urdu, are educated enough to be able to read English anyway. And sometimes it's better to send it in English because at least that encourages the parent to ask the child, so there's that communication between them as well.

It is first important to note that at this stage, Shazia uses a discourse which separates her own identification from the community through the objective pronoun 'them'. During her later discussions where the 'other' is transformed into a self-identification (see section 5.3.4) she takes ownership of her identity with the community by personalising her discourse.

Although Shazia was critical of the parents she recognised the improvements in parental involvement over the preceding decade, certainly when reflecting directly on the number of parents attending consultation evenings. Interestingly, the other teachers interviewed (all of whom were white) centred any discourse about culture around language issues. Here, Shazia challenged some of the dominant ideas about language held by schools, such as the beneficial effects of sending home information in the second language that is used in the home community. Furthermore, the white teachers stressed the importance of treating each child's individual needs within the context of their classroom and avoided focusing on culture as a factor influencing their teaching practice. Shazia tended to speak in generalities about her representations of the parents of the children in her school and this might have prevented her from understanding other needs the children in her classroom may have. This point will be enhanced further as the chapter progresses.

To explore Shazia's cultural representations of parental involvement, I further enquired about the type of parent she considered would be engaged in the children's learning at home:

> Sarah: In your experience are those parents either, possibly well educated in the country that they come from or have gone through this system?
>
> Shazia: Always, almost always. Either that, or you have someone extremely dedicated and doesn't want, you have, and this is the probably that the fewest ones of these is, didn't have anything themselves, didn't have the education, didn't have the opportunities and want their children to, and they will **go out of their way to make an effort**. Whereas, all of those, all of the people whether they're themselves educated, or whether they want their children to be educated, or they went through the school system or whatever, makes up less than half. I would probably say in total that makes about a quarter, or a third. The remainder, they just don't.

In this section of the interview Shazia projected a multitude of identities on the parents of the children in her school. However, the parents to whom she gives a positive identity are then said to be in the minority. The negative ways in which she identifies the 'other' have the power to impact on the children in the classroom. Monifa's interview revealed how the construction of meaning and the undertaking of a practice were bound up together, and that they were implicit in her identity construction. More importantly, that the teacher played a role in

helping to construct her achievement identity. In the same vein, Shazia's construction of achievement, if reflected through the negative generalisations about the home community, might also influence the meaning systems and practices she adopted in the classroom.

Stressing her point about the identity of the 'other', namely the Pakistani community, she reaffirms the point by making cultural comparisons in the value placed on educational achievement between the Pakistani community (to which she belonged) and the Indian community:

> Shazia: Unfortunately, I suppose I shouldn't really say this, in the Pakistan community particularly, there's a very strong attitude that education [takes place] in school, that's it, full stop, you don't have to do anything towards it. So regardless of who they are, how they're brought up, they don't do it. Whereas Indian parents...they're very supportive...you will find difference between the Indian parents, sort of, looking at the broad spectrum, they will be far more helpful than, academically, even if they're not educated themselves they will make an effort to do something, they will pay for tuition

Shazia makes it clear here that she is speaking in generalisations and acknowledges the within group variations that will occur. In some ways she is arguing that Pakistani identity is less prone to construction in a way that takes responsibility for school independent of parents' own education. It is about the constrains associated with social ethnic identity as she sees it. Throughout the

interview she was increasingly critical of her own community with respect to parental involvement, which reflected the changes in her own values. She was aware that the changes in some of her educational values and practices had come about because she was educated in the British school system, which arguably led to the construction of a hybrid identity. Added to this is the fact that her family was now the fourth generation to be brought up in this country, which could increase the gap between herself and some of the parents in the school further. Her heightened criticism of her own community may also have attributed to her role as a teacher and the frustrations associated with a lack of parental involvement stemming from her struggle to get the children to complete homework:

> Shazia: As far as **I'm** concerned, and **I'm** speaking strictly personally, um, parental involvement used to be to the degree where for us, **at a school like this**, where, if they can simply acknowledge the fact that their children get homework and encourage them to do it, that would make a huge difference to us…I think this is, that the parents don't actually ask them. It's not an automatic, 'do you get homework, do you have any?' We actually send out, um, a home-school contract which all the parents sign, it's signed by the school and by the children to say that they will be getting it, it tells them exactly how much homework. But it's just, **because a lot of our parents are Asian it's just not one of those priority things**. There's other things, family, this and that, and they come up with things that are much more important and it ends up at the bottom of the pile. Nobody bothers to query it. And a big problem is that a lot of our parents, I won't say all, but a big majority of our parents very subconsciously I suppose, but very strongly feel that, anything to with

> work is the school domain. Their parents, they feed them, clothe them, but apart from that, if they're sending them to school, anything to do with school is not their problem. So they don't deal with it.

Here we really see the shifts in the ownership of the discourse to the 'other'. Shazia suggests a direct association between a particular cultural group and a lack of parental involvement. It is unclear what Shazia means by 'at a school like this' but given her continued reference to the South Asian community one assumes this is the focus. However, despite the qualification of the 'other' her knowledge of the community provides insights which are not available to teachers who are not in this position. In the next section it begins to emerge that her representations of parents are related to her own experiences belonging to that community. For teachers who work in a multicultural classroom it would not be possible to gain this depth of understanding about every cultural nuance for each child. Therefore the preponderance of one cultural group may increase the appearance of the qualities of that group. Arguably, Shazia's tendency to speak in generalisations could have become a hindrance to the knowledge she imposed on the children and parents in her classroom.

5.3.2. Identifying the other and self-identification

Continuing with the discussions on the home-school relationship, the interaction between identifying with the other and self-identification begins to emerge. Shazia began by recalling to me that the school held a numeracy exhibition for parents, particularly for those who were going to be new to the school (approximately sixty children) and only two of the parents attended. Shazia

dismisses the normal mode of explanation for the low turnout, that of language difficulties:

Shazia: As a school we are, fifty per cent of our staff here speak community languages, parents are totally aware of that. They know that when they do come they can always speak to someone who speaks their language, yet, very few of them come in. And we always try and do it at a time when, you know, three o'clock, so they can stay for half and hour and then collect their children at three thirty. Its not even, you know, a difficult time it just doesn't happen, unfortunately.

Sarah: Do you have any idea why you can't bring them in?

Shazia: Well I mean basically, as I said before, **having grown up in the community,** having gone through the same problems that my family, because we're now fourth generation. My kids, well my parents are very much like my parents are here now, at the school. And it was, more or less, well you go to school, that's it, you know, their responsibility stops the moment I step on to the school's doorstep, as it were. And things like homework and schoolwork is all to do with the school, it's got nothing to do with them. **Whereas, I now, having gone through the education system here, I personally as a parent, if my son brings homework, I have to. Also I want him to be responsible, but I also need to make sure that I back up that responsibility** and remind him, he is a child at the end of the day. 'Have you got your homework?' 'did you do it?', 'have you done it correctly', 'Oh, mum I'm stuck', 'ok, let me have a look and I'll explain'. Like I said, some of them simply can't, some of

> them simply don't. And then you get perhaps about, twenty-five per cent who always do.

With this quote there is a shift in her identification scheme which instigates the interaction between her own experiences as a member of the community with notions of 'other' brought about by belonging to the teaching community at school. One of her most stable cultural representations that she attributes to the Pakistani community is the value of education. But it is her own transformation in values and practices, which are most telling. She described that her own changes resulted from her participation in the British school system. It is also important to recognise, according to some of my teacher informants, that drawing parents into the school for exhibitions and workshops is problematic for many schools, regardless of their ethnic make-up. Another relevant point is that while Shazia perceived the school as reducing the gap to a technical language issue, she herself refused this explanation preferring to locate the explanation in identity. These identities have as resources cultural representations of what is to be a parent of a school child. However, as she illustrated, she drew from a cultural representation that incorporates the British upbringing.

This next quote reveals how her negative representations of the home environments and the practices of the children she taught was different from her representations of her own home practices. Shazia had made changes to the ways she engaged in home numeracy practices with her own children which, at least partially, will have been influenced by her experiences as a teacher. The practices

she tells me she engaged in, and the implicit ways in which she conducted them were very similar to those promoted in the school community:

> Shazia: I think, things like, just as an example, things like multiplication tables. Because, it's very factual knowledge, it's very there, you know, it's something that I suppose almost, needs to be learned for the child to tackle other problems and things like that. So, if they can even just participate. **You know, the way I taught my son, well, I didn't actually teach him, but helped him to learn his tables was by games. You know, we did square numbers and one morning we'd walk to school and it wasn't even something at home it was ten minutes to school, it would be 'ok, let's do our square numbers today, ok, let's do our three times table today',** and just by that, um, just participating, its not even a specific, you know I can't pinpoint and say 'I want them to help with their tables', it's just little things, you know, when you do send something home where you expect the child to come back with an acquired concept or an acquired knowledge, we just want parents to participate. **And I do appreciate the fact that so many of our parents either have a different way of doing things or have little knowledge of how to do things, I do appreciate that. I mean, you know, in that sense then they at least could encourage the children to do it themselves, but they don't.**

Her use of practical help at home with her own children, from her perspective, separates her from her community, and she uses it as a marker to cement her self-identity. At the same time, Shazia reveals an appreciation of the varied ways in

which educational practice is represented in the home community. What Shazia appears to seek is an emotional level of transformation from the parents in the form of encouragement. Chapter six, in the section on past experiences, explores in more depth changes in practice on an emotional level for parents. For the White teachers, home numeracy practices like incorporating timetables into everyday practice was not an issue of culture but one of experience. I sought to understand from Shazia why she thought parents in her school weren't engaging in the kind of practical activities she describes above:

> Shazia: I mean, it's not, I don't know...if you look at it historically, it stems back to when they were living in villages in Pakistan or in India and things like cooking is done on an open fire, it's dangerous I suppose. If you go back that far, then there's probably reasons behind it, but it becomes, things like that which start as habit or necessity become cultural, don't they, it becomes part of the culture. And you do tend to, and children are very much seen as a blessing and they are there to be pampered and looked after until so-and-so age and then they start taking care of themselves, although there's no specific age. **They're** not taught to be independent, again, I think I was discussing this with someone, that our children are so, so dependent...and I'm talking in the context of our school, a lot of our Pakistani families in particular, have quite large families. If you've got eight to ten children, by the time you've bathed, fed, clothed, bedded, it's probably eleven o'clock, you haven't got time to stand in the kitchen making biscuits with one of them. And if one of them does it then they all want to do it, and they've all got different attitudes, different behaviour patterns, different, you know...as I said,

> changing with the different, **as you go down the generations, I've only got two children, I don't intend on having any more, therefore I have time. We do make biscuits, and we do, you know, whenever we go to Sainsburys my daughter always, she always, this is her job now, she always weighs the fruit out.**

Shazia embeds the South Asian community identity within the context of historical cultural tradition, but accentuates the 'other' with the word 'they're'. The text highlighted in bold indicates the ways in which Shazia had made an explicit change in her self-identity different from that of her ethnic community. She also perceives her own evolution of practice as a product of being the fourth generation of her family to have been raised in Britain. History of culture plays an important role in the way she identifies the 'other' and the traditions and practices she attributes to them. The finer nuances of practice, like cooking, are given a cultural status because of her tendency to connect culture and history. Many of the practices which Shazia would like to see parents engage in, such as learning times tables in a game-like way, are not necessarily prevalent in white British households. This was true for some of the white British parents sampled in this research. For Shazia, the concept of culture was much more salient than other explanations which could be attributed to other cultural groups. Shazia retained cultural differences as her fundamental explanation of the parental involvement by using a non-academic example of practice to legitimise her point:

> Sarah: Some of things you've mentioned would be what I would describe as quite middle class things to do as well as white cultural things

Shazia: Yes, they are. But I mean, things like, just silly things like bath time. In Pakistan, and everybody comes to my house and says 'why have you got a bucket in your bath?', we do not fill the bath up with water and lay in it, that is unclean. You don't have bath, you have a shower, or get a bucket, fill it with water and you keep wash yourself, you don't fill the bath up, you washing yourself and pouring clean water over yourself. That's how you get clean, and we, oh my goodness, the first time I ever filled the bath up with water and lay in it was after I got married. You know, and I didn't know, 'oh why didn't I ever do that?'. I don't think in my mum's house there's a bath plug, it disappeared years ago, we never had one because nobody ever filled the bath up. It's just not the done thing. Whereas my children had little letters and bath toys and, you know, I still took them out and washed them, still took the water out and the bucket and cup, but they could play in it. But things like that, and counting cups of water, fitting them into the bucket. Silly things that you wouldn't, I don't know, a lot of things our children still don't use. Um, so I suppose some of them may well … but some are just experience

Shazia describes a situation where she has combined a traditional cultural practice with a practice for numeracy learning. This is a fascinating example of how complex it is to draw on those mundane activities as contexts for learning basic mathematical concepts.

There is one instance in Shazia's discourse where her 'self-identification' and 'identifying the other' match and she aligned herself with the Pakistani community:

> Shazia: This probably applies more to our children because they have very little experience, one of the other teachers was asking me, don't these other children eat anything at home? Because whenever you ask them they don't seem to know what they eat. I said that's mainly because, and again this is a cultural thing, children are very much pampered to quite an age. I notice, you know, this is the problem that the nursery has here, whereas an English child or a Western child may well come in being able to dress themselves and feed themselves, you will find, and **I'm guilty of this as well,** but six year olds and seven years olds are still being dressed by the mums and fed by the mums and it's just cultural, it's very much a strong cultural thing.

In this quote Shazia is drawing on a meaningful construction of child development that is attributed a cultural status. The evidence in this research described in chapter four, suggests that cultural constructions of child development are in existence. Rajesh's mother (Indian) is the most vivid example in this study of a parent who represents child development in the way Shazia described. Moreover, Shazia's examination of this representation as 'cultural' lends weight to the idea that culture mediates subtle differences in the way the educational world of the child is understood. It is these finer representations of culture that those outside (and often inside) a particular community cannot recognise because they are so embedded in cultural practice.

5.3.3. Being Identified

Shazia did not reflect on how the parents or children might identify her. There was evidence in the interviews with some of the other teachers that they reflected on how the children, in particular, perceived them. These reflections were often strongly influenced by their past experiences and teachers from their own childhood. It is notable that Shazia did not raise these points herself. However, representations of past experiences have formed an influential part of the analysis within the thesis and form part of a chapter in their own right. Therefore, representations of past experiences are discussed in greater depth in chapter six.

5.3.4. Self-identification

Shazia's own self-identification is a complex combination of stable cultural affiliations with the Pakistani community and transformed meaning systems and practices brought about by being raised in a different education system and country. One of the stable aspects of Shazia's self-identification was her maintenance of certain cultural traditions, such as wearing the traditional Pakistani dress, the Shalwah Kameez, and honouring religious festivals. Shazia's biggest change in self-identification was manifested through the change in practice with her own children. Her own experiences as a child, as we have already seen, had altered some of her own practices:

> Sarah: Have your experiences, either as a teacher or at school, helped with your own children's education, can you tell me a bit about it?
>
> Shazia: I have to admit that I have never ever sat them and taught ...and I don't know whether this is an experience of being a teacher or a student but

> just the fact that I grew up in this country, and I think **I was always envious of all my English friends who did go home and bake cakes at the weekend.** I just got told to get home and cook dinner. I was really young when my dad, my dad taught me how to cook, he just taught me for the sake of having an extra person in the house who could cook. I appreciate it now, but I didn't then. So I never experienced, you know, things like going to the seaside and going to the cinema. And he would never allow me to go the cinema, taboo. So doing things like that, I think that's more to do with experience of growing up in this country, rather than teaching ... a pupil. I mean saying that, things like going on school trips, I would never have gone to those places if it hadn't been with the school, and because it was school, school says 'fill on the dotted line', and my dad would say 'ok, go and do it'. My dad was very much into, get your education, not that it will do anything to help you, but you've got to get your education, so.

Shazia drew on the childhood practices of some of her British friends, to inform her practices for her own children. There were aspects of Shazia's childhood where she felt both deprived and separated from her classmates at school. She was evidently aware of the differences in the home practices of her English friends, from those of her own family. At this juncture Shazia could have chosen to accept or reject the practices of her home and past. It is the ability to reproduce or transform which makes each self-identification unique.

In this part of the chapter Shazia has predominantly described the ways in which she has distinguished her own identity from that of a woman in the community to

which she belongs. She has done this by using the evolution of cultural history, believing that the parents of the children she teaches shared the representations of her own family. Through the combination of her experiences as a teacher and some negative experiences of her own schooling, Shazia had made changes to the practices with her own children. The practices, which she had deemed necessary to change, like 'practical like' numeracy skills, were aligned with British schooling. The stable cultural affiliations with the Pakistani community do not centre around the act of learning per se, such as ways of dressing, religion and representations of child development, so therefore have been reproduced. By these means, self-identification is a complex mix of reproduction and change.

The fact that Shazia's classroom was for the most part made up of South Asian pupils is significant. In a multicultural classroom it would not be possible to make the same cultural generalisations about the pupils and their parents. The following quote from Anna, a white British teacher from school A (the ethnically mixed school) illustrates this point:

> Sarah: Are there any instances where you feel culture plays role?
>
> Anna: No, not here, I don't think because we have such a wide variety of children of different cultures, and there are so many different parental attitudes within all of those. You have some parents who are very keen and eager from all of those cultures and then you have some parents that are not. I haven't experienced really, where a whole band of a particular culture have reacted in a particular way

Classrooms which are predominantly White are seen as cultureless. Like in many other areas of society 'white' is not as visible as factors such as class. Shazia felt she had a depth of understanding about the South Asian community that allows her to cement both their identity and the changes in her own identity. It is important to note though that this is not to say that the White teachers did not have an identity. However, Shazia is not typical of the teachers in this sample because she drew predominantly on ethnically based representations of identity in her narrative. The White British teachers on the other hand, when drawing on representations of identity reflected on the types of activities they thought certain parents would engage in, their own performance as a teacher or the type of teacher they wanted to be perceived as. As previously mentioned, these were often bound together with their own representations of past experiences as a pupil, or their previous experience in other teaching posts and these points are raised in chapter six.

The next section in this chapter is going to explore the analysis of the parent interviews, paying particular attention to issues of identity.

5.4. Identity and the parent: reflections from ethnic minority parents

The analysis of parental identity is going to focus on the same three levels of identity formation used for Monifa and Shazia; namely, 'identifying the other', 'being identified' and 'self-identification'. However, this section of the chapter is not going to focus on one particular case study, but will access interview data from a number of the ethnic minority parents. The issues raised by the parents in

relation to identity varied in that the parents in this study came from a number of different cultures and had a host of varying experiences. Within the three levels of analysis used throughout this chapter the discussions about culture raised by the parents drew upon issues about language, gender, mathematics and the value of success as a culturally mediated phenomenon.

5.4.1. Identifying the other

Gender, as a cultural mediator of identity was particularly salient in the South Asian parents in this sample. Nimrat's mother, in the process of 'identifying the other' reflected on the gender barriers she faced as a child growing up in the Indian community. When Nimrat's mother uses the word 'they', in the context of the interview she was referring to her parents:

> Nimrat's mother: Being first generation immigrants as well, where **they** came from traditionally, culturally, the boys did the learning and the girls stayed at home. Um, the males went out and did the jobs, earned the money, the women stayed at home. Looked after home, had children, did the cooking and cleaning.
>
> (Indian: pilot school, yr 6, HA)

The quote highlights two interlinked cultural representations, one is gender based and the other relates to the belonging to a particular ethnic group. Nimrat's mother does not reflect on the ways in which the representations of gender of belonging to the Indian community influenced her current role in her community in the present. However, she did wear Western clothes and maintained a job, which

indicated a shift away from the traditional role of an Indian woman that she identified in the quote above.

The next quote is another example of 'identifying the other' but instead of drawing upon the issue of gender identity, this Indian mother speaks about the 'value of success' that should be promoted in the education of children. Four of the other ethnic minority parents spoke about how they valued the representations of success with their home community and their discourse has been included in other levels of the identity analysis, which will become apparent as this section of the chapter progresses. However, Sumana's mother was the only ethnic minority parent, who in mentioning the value of success, did not refer so much to ethnic issues, but social class experiences:

> Sumana's mother: You see I think it has a lot to do, you know how people say like, you know, it's a wicked world but unfortunately some of it is true, so if you live in a council estate, that's all you see that's all you're gonna go for. Whereas, if you have professional parents um, it's part of your life. But I also feel that if you do have parents where they didn't have the opportunities but you have, they should also be given a chance.
>
> (Indian: school B, yr 6, HA)

Here, Sumana's mother is looking at the value of success as a class issue, a factor which was not raised by any of the other parents from the white or ethnic minority groups in the study.

As with the analysis on Shazia's interview it was not always the case that within the same narrative one level of identity was visible at a time. The complexities of the construction of identity were apparent in the parental analysis as the different levels of identity emerged as simultaneous constructs.

5.4.2. Identifying the other and self-identification

There was another parent in the sample who drew on the role gender to construct and maintain two levels cultural identities. In the following quote Fazain's mother (Pakistani: pilot school, yr 6, LA) goes on to 'identify the other' at the community level, but as she talks about the cultural values of the previous generations she indicated how aspects of her own identity had altered. She extends a new cultural identity to her sons:

> Fazain's mother: My son who's older, he'll help him [with his homework] without him I don't know how I would do it. Because his dad doesn't, he doesn't get chance to, you now; it's the mother's responsibility, the children. Mothers, they have to cook, they [the fathers] are so free they come home and watch T.V and you know, they say 'oh, we're tired', it's the mothers, they work, but they still have to look after the children as well. It's unfair I think, ironing and washing, cleaning up and this and that
>
> (Pakistani: pilot school, yr 6, LA)

On a personal level Fazain's mother struggled to maintain the traditional role of the woman but exercised a new identity by working and doing a course at college.

Fazain's mother went on to discuss how gender representations continued to be maintained in the South Asian community:

Fazain's mother: It's like in the Asian community the daughters, they obviously get married but boys they have to spend the pennies, they have to look after the older parents. They have to respect their family, they don't really do like most of the English, they leave home when they're sixteen, Asians don't do that. But these days they do

Sarah: What would you like for your boys?

Fazain's mother: I would like my older ones, when they get married if we get old, because I hate being old, I said I don't want to be old, I would hate to be old. I don't want them to live too far away but I want them to be separate with their wives

Sarah: Are you happy with that, the change?

Fazain's mother: I'm happy with the change, yeah, the culture. Yeah because, I'll be honest with you, I didn't like living with my in-laws. It's so hard, you know, it's really difficult

Sarah: Because you haven't got that freedom?

Fazain's mother: Yeah, because my husband, he's from here, he studied here, he lived all his life here. So you know, with the olders like, your in-laws, they don't like you speaking, they don't even like the kids speaking English. You know, it's not fair on the children, when they live in this country I think they should be able to speak English as well. They should be really good at English

(Pakistani: pilot school, yr 6, LA)

Despite her upbringing in Pakistan, it seemed that Fazain's mother had made large changes in the way she represented the future lifestyle of her children. Her representations of the 'other', which in this case is the South Asian community on the level of gender divisions and familial duties, had been transformed to accommodate her new way of living. She appears to have been unable to maintain the change of representation in some parts of her practice, continuing to undertake a specific gender role in the home.

The merging of the two levels of analysis of 'identifying the other' and 'self-identification was a salient part of Monifa's father's discourse at one point in his interview. He was one of the four ethnic minority parents who spoke about the value of success as a cultural representation relating to ethnicity. It is through his discussions about how he had come to value success that his construction of identity emerged. Monifa's father spoke about the way his upbringing in Nigeria gave him a value of success and the will to succeed at his school learning:

> Sarah: You've gone very far with your formal education?
>
> Monifa's father: Well it's, I think it's, they say a bit of culture to be honest, they say, there's a cultural aspect in that a lot of Commonwealth countries, they still hold those values that **the British** brought in, in terms of, you know, getting educated to the best that you can get. And **they, we've, Africans** have sort of like taken it a step too far, they go absolutely mad about having formal qualifications, and there was that pressure anyway.
>
> (Black African: school A, yr 6, HA)

It is interesting that the value of success is identified by Monifa's father as a British value, which on a societal level her father suggests the Nigerians had adopted as part of their own. His personal discourse is also quite mixed in terms of his 'identification of the other' and 'self-identification'. His description of 'the British' identifies his concept of the 'other' but at the same time there is some verbal confusion over his self-identification as an African in the switch between 'they' and 'we'. Conflictual identities are at times perceived as the domain of the developing child/adolescent because this is the time when the formation of the identity is in its infancy. However, Fazain's mother, Monifa's father and in the next section, Rajesh's mother all reveal in their discourse instances where an interchangeable identity is maintained in adulthood. For the latter two parents this is perhaps more obvious, given that they were first-generation immigrants, both born and educated in different countries to the one their family now resides. For Rajesh's mother, as a second-generation immigrant she felt that her knowledge of her culture (e.g. religion or language) created a greater divide in the formation of her own, and indeed her son's identity.

5.4.3. Identifying the other, being identified and self-identification

Rajesh's mother spoke about the mediating role of language in the construction of the identity of others, the way she understood how she was identified and the identity both for herself and for her son. As a second-generation immigrant from India, she felt that she wanted her son to maintain his cultural identity as an Indian through the use of language. Within the following passage it was obvious that

there was some change in her own identity and she felt that extending two cultural identities to her son would make his life less conflictual:

Rajesh's mother: We want him **to learn Gujurati because that's our religion as well, cos I was taught both religions it's easier for him to learn Gujurati while he's learning English as well.** And now at this age they can pick a lot more up because when he gets to eleven and that, and he says I don't want to learn Gujurati, that's fine you concentrate on your English and your maths.

Sarah: Do you speak English at home or?

Rajesh's mother: No, we speak both languages with him, but the problem is he only speaks English. He understands Gujurati, he knows everything that's going on but he just doesn't talk it, so we want to teach him to write. Cos I never learnt how to write, we want to teach him to write and learn at the same time. And languages are good because its his understanding of who he is. **Cos the problem with us right, we're not English and we're not Gujurati, we're stuck in the middle**, it's true we are, we're stuck in the middle. **Cos one half of all our mates are English and that, but at home you've got to be a civil Gujarat, Indian women.** That's the problem he's going to have as well, but at least by knowing what each one is, it will be up to him. At the end of the day he's going to be English, cos he's born and brought up here like me. But he can still have a bit of his background, he knows what he is

Sarah: Do you think for him it will be a combination of both languages and both cultures for him?

Rajesh's mother: Yeah, yeah, cos we're not gonna say 'oh be a typical Gujarat boy' you can say 'be an English boy but be a Gujarat, know where your roots are, know who your Gods are, know who everything is'...That's why I'm teaching him because of what I missed out, I want him to know, cos I never learnt how to write Gujarat, I can speak Gujarat, but I can't write it. But I want him to say 'yeah, I can write Gujarat as well if I want to'.

(Indian: school A, yr 2, LA)

There are a number of complex issues to come out of this narrative with Rajesh's mother. Rajesh's mother uses language to extend a particular identity to her son, who she feels as an English speaker only, may become separated from his Gujurati identity. Here, she draws on her own dual-identity that has arisen as a consequence of being raised in Britain and the Indian community. Religion becomes an important self-identification system for Rajesh's mother, which is closely related to issues of language. His mother feels her own son's identity is weakened by the fact that she is not strong on some elements of her Gujurat upbringing. In many ways she is displaying some of the identity conflicts apparent in Monifa's interview at the beginning of the chapter. The consequence of her identity conflict as a child has resulted in a transformation of her extended identity for Rajesh. What we also see here are the ways in which she has two self-identification roles in different communities of practice whereby she has an identity at home as a traditional Gujurat woman and an identity as an English

woman. Her use of the phrase 'we're stuck in the middle' suggests that this hybrid formation of identity can sometimes be conflictual. This gives some indication of the way conflictual cultural identity, like Monifa's, remains stable into adulthood, and is not solely the consequence of the school environment.

5.4.4. Self-identification

Although Shazia considered that language was not an obstacle for the South Asian parents of the children at her school it was raised by two of the ethnic minority parents in this study and formed part of their self-identification in terms of the representation of culture. For Fazain's mother (a parent whose child was in Shazia's class) having English as a second language affected her ability to help her son at home with his learning:

> Sarah: Did you go to school in Pakistan?
>
> Fazain's mother: Yeah, but it's different because when we learn it is in Urdu, which you can't use here. It's English, you have to do it in English here like maths and reading and writing
>
> Sarah: Is the way they teach mathematics very different from the way you were taught in Pakistan?
>
> Fazain's mother: Yeah, it is different...I think my language, in Urdu, won't help me here, in this country. It does help back, you know, where you come from, to have education where you come from, it does help if you go back. It won't help here at all
>
> Sarah: Is it the maths that is different or the way it's described?

> Fazains mother: It's the way it's described, it's the same like, 2 and 2 it's the same but when we say in Urdu they don't really understand
>
> (Pakistani: pilot school, yr 6, LA)

As a first generation immigrant educated in Pakistan, she felt her ability to help her son with mathematics was limited because of the language differences associated with the learning of the subject. Even if, at the most basic level, the mathematics remains the same, language was depicted as a barrier in the communication between the mother and her son with respect to the learning of mathematics. Fazain's mother went as far as saying that mathematics from Pakistan cannot be used in Britain because of the mediating role of language and this may be because they are both bound up with self-identity as a second language learner.

Samuel's mother is an example of a parent whose self-identity was transmitted through her discussions about the value of success raised in the previous section by Monifa's father. Samuel's mother was a British born Caribbean woman and his father was White British. She attributed her value surrounding success to her own cultural upbringing:

> Samuel's mother: I'll be honest with you, I'm dealing with a colour issue here too. It's this thing about, I know in my school, when I was at school there were about three black children in my class and we were encouraged from home to do your very best, that you wouldn't get anywhere in life. And I recognised that I suppose, that part of me does come through, even

> though my children are mixed heritage it still doesn't make any difference as far as I'm concerned, I still think they should do their very best
>
> (Black Caribbean: school B, yr2, HA)

Samuel's mother extended her own positive identity, which she perceived she received in her own home community to her son. At the same time she recognised that his cultural identity would be different from her own because of his mixed heritage. However, the value of success, which she had maintained as part of her own identity, was a meaningful part of her cultural representation. Her construction of the value of success may also have developed because her childhood was located in a particular historical time and geographical location. Samuel's mother referred to being one of three Black children in her class, so like Samuel, she experienced what it was like being an ethnic minority pupil in a mainly White school[7].

While the value of success was promoted in some of the White British households, for Monifa's father and Samuel's mother it had become salient through the mediational role of culture. Both of these parents had received similar values but on different contextual levels. Monifa's father looks at the value attribution from a macro/institutional context. Nigerian values are homogenised and are seen to represent a nation. Samuel's mother perceived that the values she

[7] Samuel was one of two pupils in his class from an ethnic minority background

received were instilled at the micro context, within the family. Both of these parents sought to reproduce the values of success instilled in them.

While these parents spoke about cultural identity through the representation of different themes, they shared a common thread of understanding. Some aspects of identity make the transition through time from previous cultural experiences at a time when the formation is at its most critical, notably in childhood. Given that this piece of research is about school education it is not surprising that this is the case, since school-based learning occurs at this time. However, issues around identity continue to reveal conflict into adulthood and this in turn affects the child's current learning. Monifa's narrative at the beginning of the chapter showed how her father's own identity issues surrounding the value of success influenced her in 'being identified'.

Furthermore, the parental analysis has brought to light an aspect of self-identity not seen so explicitly in other parts of the analysis of identity in this chapter. Rajesh's mother, in section 5.4.3 not only represented all three levels of identity formation within one narrative, but she implied the existence of three self-identities. These two self-identities, namely 'not English', 'not Gujurati', but something 'in the middle' have theoretical implications for the notion of coupling discussed in chapter two. In other words, there are hybrid ethnic identities, which may be particularly relevant for those ethnic minority individuals who are second generation (or more) immigrants.

5.5. The child identity task

The three levels of analysis used throughout this chapter have been conducted on the data for the child identity task. The analysis raised the following question: how did the children sampled represent the home and school life of a high or low achieving mathematics learner? The focus of the story lay on the main character, the family of the character, the character's friends and the teacher. For this reason the concepts of 'identifying the other' (friends and family), 'being identified' (teacher) and 'self-identification' (representation of the main character) have been useful.

5.5.1. Identifying the other: the role of the family

In the storytellers' narratives, the life of the character in relation to family revealed the most positive and negative dichotomies. Of the twenty-seven children who were interviewed (15 = ethnic minority pupils and 12 = White British pupils) for the child identity task, fourteen gave the character that was good at maths a consonant family life that was also positive and the character that was bad at maths, a negative family life. Eleven of the children gave both families good characteristics and this has been described in the table below as dissonant because this is counter to what one might expect. Two of the children sampled had an 'inverted' family dichotomy with the 'good at maths' character having a negative home life and 'bad at maths' having a positive home life. The following table identifies how the figure reported here breaks down according the storytellers year groups and levels of achievement[8].

[8] None of the children from the pilot school took part in the child identity task

Table. 18 The year group and achievement levels of the storytellers according to their ratings of positive and negative dichotomies of characterisation

Year group and levels of achievement of storytellers	Consonant	Dissonant	Inverted
Yr 2 – HA	3	5	-
Yr2 – LA	2	2	1
Yr 6 – HA	5	2	-
Yr 6 - LA	4	2	1
Total	14	11	2

Looking first at the 'good maths/positive family' category, prevalent representations came through many of the storytellers narratives. The defining characteristics of a high achiever with a good family were closeness, strictness with homework and high expectations from the parents. These families were frequently described as 'loving' and 'caring'. The parents in the story worked hard and were generally high achievers themselves. The fathers, when described in more depth, were depicted as going to work and the jobs listed for them were lawyer, shopkeeper, builder, carpenter, mechanic, cab driver, engineer and a college student. The next quote from a year 6 pupil in school A (high achiever) shows how achievement and status was represented co-constructively by this storyteller:

Dharmendra: Maybe he's got a good job like a lawyer or something

There was one instance where a father within this category was described in a negative way, in the sense that he was physically abusive to the main character. The storyteller (Amy; school B, year 2, LA) could not explain why she had added

this aspect to her story and did not relate her own home experiences with that of the character in her story.

The descriptions of the mothers in this category were all positive. The main character in the story tended to be close to the mother, who was frequently described as 'helpful' and 'clever'. The next quote from Dale (White British: school A, year 6, LA) is an exemplification of the description of a mother for the consonant group. I asked Dale to tell me a little bit more about his character's mother:

> Dale: Very, very, very nice, and very understanding, considerate, like I said. Maybe his mum is the one making him feel confident.

The character that Dale was talking about was the 'good at maths' boy and it is interesting that Dale acknowledges the extended identity received from the mother towards her son's learning. It is this identity, which helps the character feel positive. For many of the storytellers the mother had a domestic role, cooking dinner and buying things for the main character. In one story the mother had a part-time job and in another was a school teacher.

We turn now to the negative family life of the low achieving children that was depicted by the fourteen storytellers. The table below describes in more detail the negative aspects of family life depicted by the storytellers. In some cases a storyteller had filled more than one category (e.g. having a nasty mother and

father) within the same story but the most prominent characteristic has been reported here:

Table. 19 The number of times a negative aspect of family life was depicted for a low achieving child.

The negative aspect of family	Number of times the negative aspect was described	Ethnicity and year group of the storytellers
Nasty father (physically abusive)	2	White British (yr 6) Pakistani (yr 6)
Nasty mother (verbally abusive)	2	Indian (yr 6) Bangladeshi (yr 2)
Disinterested family in the child's learning	2	Pakistani (yr 2) White British (yr 2)
Family embarrassed by failure of the child	5	2 x White British (yr 2) Indian (yr 2) Mixed Heritage (yr 6) Black African (yr 6)
Family is poor (plus mother and father argue)	1	Mixed Heritage (yr 6)
Death of mother	2	Pakistani (yr 6) Black Caribbean (yr 6)
Total	14	*N*= 4 White British *N*= 10 ethnic minority

The details in the table above raise two interesting problems for the analysis: (i) what is the source of these extreme representations of the 'bad at maths' family life? And (ii) why was there such a high proportion of ethnic minority pupils represented in the table above (when one considers that 15 of the 27 children sampled were from ethnic minority backgrounds)? The answers to these questions might be related in that the children appeared to be projecting a worst-case scenario for the character in the family. None of the storytellers described their

own families as similar to the 'bad at maths' character. In earlier parts of this chapter the case study of Monifa revealed how strongly represented the home community was as her identity as a mathematics learner. Tenuous links may be postulated about the strength of similar representations held by other ethnic minority pupils, where the home community is considered an influential part of success in the school community to a greater extent than it is for White British pupils. Family pride and a willingness to show support in the child's school learning was perceived as an important characteristics in contributing to the child's success. While many of the children were not able to articulate such issues in their main interview, like Monifa, this projective technique facilitated the children's representations of home learning. The storytellers were most obviously conscious of the emotive feelings of the character's family, when 'identifying the other'.

Turning to the eleven storytellers who described dissonant families with both high and low achievers as positive, it is possible to see from the table 19 that this scenario is predominantly presented by the year 2 children. At this age (6/7 years old) these children still held the view that families are positive regardless of the circumstances within another community of practice like school. For the year 6 children in this category the family were perceived as 'loving' and 'caring', endeavouring to help the main character with homework to the best of the their ability.

Finally, the two cases which particularly stand out from the twenty-seven children interviewed for the child identity task were the inverted family dichotomy with 'good at maths' having a negative home life and 'bad at maths' having a positive home life. One of the storytellers was a year 2 [Saeeda] girl in school A, who was a first-generation Pakistani. She described her 'good at maths' family as 'nasty' because they didn't think the main character worked hard. When I asked Saeeda about the character's family this is what she told me:

> Saeeda: Horrible to her
>
> Sarah: Why? In what way?
>
> Saeeda: They don't think she doesn't *[sic]* work really hard
>
> Sarah: Do they ever say anything to her?
>
> Saeeda: Nasty things to her

On the other hand, the 'bad at maths' family is described as 'nice'. It became clear from this child's identity interview and main interview that she had her own negative feelings about her home life, which corresponded with her story. Despite being a low achiever at school Saeeda was highly praised by the teacher because of the immense progress she had made since arriving at the school. In turn, Saeeda identified herself as achieving well in mathematics. In the identity task she also matched herself with the 'good at maths' character, and identified a similarly difficult home life whereby she was given little recognition for her achievement and felt rejected by her mother.

The second case with an inverted representation of home life was told by Domonic, a year 6 mixed-heritage boy in school B. Domonic described the 'good at maths' character's family:

> Domonic: They're very posh. They're quite rich, and they think that they're better than anyone else, so like really snobby.

Both the parents of the character in the story worked long hours and the mother in particular was self-obsessed and conceited. The family of the 'bad at maths' character on the other hand was described as 'really nice, they um, cook'. The family contained a mother, step-father, brother and baby sister. Domonic felt that the step-father was not always nice to the mother, but was nice to the main character. In essence, mathematical success for Domonic's characters was associated with power and status. But on the other hand, the 'good at maths' character was not happy with his family in the way the 'bad at maths' character was. When I asked Domonic to describe what life is like for the two boys (Marcus = good at maths and Samuel = not good at maths) in his story he told me:

> Domonic: Marcus, he pretends that his life is all good, but Samuel knows that his family is [all good]

Domonic identified himself with the 'bad at maths' character, both in terms of his level of achievement and in terms of the positive context of his family life.

One aspect to emerge as part of the identity task were the job roles the children offered for the 'good at maths' character with the positive home life fathers would have. Only one of the jobs listed would be considered 'professional' and many of the other jobs (e.g. cab driver) have been reported in Abreu and Cline's (2003; 1998) work on children's identification of the use of mathematics in different practices and societies. Their work revealed that children felt mathematics was needed in some practices more than others, and in turn whether people undertaking these practices would be good or bad at mathematics. There was a tendency among the children to choose blue-collar jobs, like driving a cab or being a shop assistant as being the worst at mathematics. Although there are some fundamental differences between the studies in that the Abreu and Cline (2003; 1998) study asked the children to sort between a set of jobs and make judgements based upon that, it is interesting to note in this study that the children, on the whole, gave the fathers of the 'good at maths' child blue-collar jobs. On closer inspection of the data from these children some explanations emerged. Nine of the children sampled volunteered a particular type of job for the father of the 'good at maths' character. Out of those nine children, five were in the year 2 group, which suggests that identification of a particular job status with success in mathematics may be influenced by the child's development. As the children grow older they become increasingly socialised into understanding about success and status as described by Domonic above. The data from the three year 6 pupils is a little more complex. One of the children, Amira (Pakistani) gave the father of the successful mathematician the same job role as their own father's. Amira's father was a cab driver and she expounded in both the main interview and the child identity task

her respect and love she held for her father, which might have contributed to her identifying him with success. Jason (Mixed heritage: school B, year 6, HA) described the father (and mother) of the successful child in his story in the following way:

> Jason: I think his mum might be really clever and his dad might not be so much brilliant. But I think his dad might have some strong points where he could teach Luke (good at maths) at things where his mum couldn't. So I think they have their strong points to give him...the dad's more sporty kind of thing; it's a bloke thing. Suppose it's like teach him like football and you know, like mechanics and everything...handy jobs.

There are strong gender representations evident in Jason's story where his identification of the other (the character's father) is compensated in other ways for his lack of mathematical skills. Instead, the mother of the story fulfiled the role of the family 'identification of the other' with the high achievement of the son. Jason told me that he considered that his own mother was a successful at mathematics. Finally, there is the example of Sumana (Indian: school B, year 6, HA) whose identification of the character's family was very similar to Jason. The mother in the household was identified as being very good at mathematics (also reflected in Sumana's description of her own mother) and the character's father was described as 'just a shopkeeper'. In effect, Sumana's representation of the father in the story supports the findings of the Abreu and Cline (2003; 1998) study.

There was a developmental aspect to the identification of the family life of the characters in the story, whereby the children in year 2 tended to dissociate the achievement of a child in one community of practice with the family life depicted at home. Believing that a child who was 'bad at maths' would have a positive family life on an emotional level is not unrealistic. However, those children who rated the 'bad at maths' family life as negative on the whole did so on the grounds that the parents would show less interest in the characters school learning. There was a prevalent assumption running through the children's main interview that children who were good at mathematics had more support at home from their parents. The two inverted dichotomies of family life for a high or low achiever demonstrate a way of 'identifying the other' which had the most similarities with self-identification in the real life of the storyteller.

5.5.2. Identifying the other: the role of friends

The storytellers were asked to identify if the friends of the main character were good or bad at mathematics. The children's identification of the friends of the main character were not as clear-cut as they were for the families. Eight of the storytellers felt that the friends of both characters would be good at maths. Three of those eight children said that the character that was not good at maths was bullied by the others who were. This is what Monifa had to say about the school experiences of her 'not good at maths' character:

> Monifa: Because she's not good at maths people will pick on her and like say she's dim or something

When looking at this quote we return to the issue of the power and status that becomes associated with certain types of success. One child felt that 'bad at maths' would feel jealous of all the friends because they were good. For the other children interviewed for the identity task there were no consistent patterns discerned in the data when it came to identifying the achievement of friends with the achievement of the main character. However, friends played a significant role in the story when the prompt was slightly different. The children were given the following story stem, 'one day at school [name of character] felt bad about something. What do you think [name of character] felt bad about?'. In this context the occurrence of bullying from friends or the main character bullying other friends was prevalent. As a rule of thumb, those who were bullied were 'bad at maths' and those who were doing the bullying were 'good at maths'. Some of the 'bad at maths' characters were given no friends at all. Again, this shows how the children project a story, which tells of a worst-case scenario. But also, the finding highlights another issue, in that when 'identifying the other' the extended identity goes beyond the focus on the academic. A child's social relationships can be situated in the context of status, which in turn is associated with academic success. Only two children in the sample reported cases of bullying which had affected them directly, one was a high achieving child and the other a low achieving child.

5.5.3. Being identified: the role of the teacher

This section looks at the way the storytellers described the teacher's identification of the main characters. Not surprisingly, in the process of 'being identified' by the

teacher, most of the storytellers used a consonant dichotomy (e.g. positive/high or negative/low) so that positive comments corresponded with high levels of achievement. However, the treatment of the main character by the teacher did vary. For the character that was 'good at maths' the teacher always recognised their level and achievement positively. Three of the storytellers' narratives expanded on their description of how the teacher projected a positive future for the character 'being identified' as going to university or getting a good job. Again, this is a window to the representation of the storyteller and their representations of success beyond schooling. One of these children was a year 2 boy (James, White British: school A, year 2, HA) whose mother, it is revealed in chapter six discussed her desire for her son to be university educated in the same way she and her husband were. James is sharing his mother's representation of the future with the character in the story. For two of the storytellers, the character who was good at mathematics was a victim of bullying, and the teacher in the story was said to express disappointment or regret that this was the situation.

For the character that was 'not good at maths' the representations of the teacher were less rigid, and ran along both positive and negative dichotomies. Fifteen of the children described the teacher's disappointment and concern for the main characters progress. The consequences of the teacher's negativity at times resulted in some change in behaviour from the teacher towards the child, for example, one storyteller (Dale) had the teacher speak to the parents about the situation, the teacher put the main character down to a lower achieving mathematics group, gave the child extra work or shouted at the main character. In the parent interview,

Dale's mother (White British) had told me about a situation with a teacher in her son's previous year which bore similarities to the one described by Dale in his story. Other storytellers who drew on negative teacher representations described how the teacher thought the character could try harder to achieve in mathematics. One storyteller felt the teacher would worry for the character's future.

Other storytellers (N=10) considered that the 'bad at maths' characters would 'be identified' by the teacher with more positive characteristics, recognising traits like enthusiasm "she thought he was doing well trying to keep up with the others", hard work "she thought she was bad at maths but getting better all the time because she did her homework" and the potential for improvement "she thought he was not good at maths but capable of more, underachiever who lacks confidence". One might expect that the storytellers who would draw on these positive aspects would be low achievers themselves, however the table below matches the storytellers' own level of achievement to their depiction of the teacher's positive or negative response to the child who was 'bad at maths' (three of the children did not give clear answers and are not included in the table below).

Table. 20 Corresponding storytellers' level of achievement to that of the depiction of the teacher's response to the 'bad at maths' character

Storytellers' own level of achievement	Positive teacher identification of the character	Negative teacher identification of the character
High Achievement	5	7
Low Achievement	4	8
Year 2	6	4
Year 6	3	11
Ethnicity	Mixed Heritage x 3 White British x 4 Indian x 2	Black Caribbean x 1 White British x 5 Indian x 2 Black African x 1 Bangladeshi x 1 Pakistani x 3 Mixed Heritage x 2

The figures shown here provide evidence that the storytellers' representations of 'being identified' by the teacher do not necessarily match their own levels of achievement in mathematics. For example, four of the low achieving children interviewed thought the teacher would have a positive identification of the 'bad at maths' main character. One of the trends among this group of children was to align their own achievement in mathematics with the 'good at maths' character in the story. Amira (Pakistani: school A, year 6, LA) for example told me that she associated more with the 'good at maths' character:

Amira: I tend to like maths

Sarah: Do you think your good at maths like Aneesa [the character in the story]

Amira: I don't know, Miss Durham [Mary], thinks I'm good at maths

This quote is telling because when Amira related the story to her own experiences, not only did she identify herself with the 'good at maths' character but she used what she believed would be the representations of her teacher, Mary, as part of 'being identified'. She had then gone on to internalise the identity she thought Mary would extend and made it into her self-identification. As described in chapter two, being identified is suggested as coming prior to self-identification. This is born out of the analysis with Monifa described at the beginning of this chapter as well. Domonic, on the other hand, openly identified himself as a low achiever in his identity task but still felt the 'bad at maths' character would be negatively identified by the teacher. His recounting of his own experiences with a teacher in a previous year might explain why he matched the two identities, the character's and his own:

> Domonic: There was Miss Connelly in this school and she used to pick on me and Jason all the time, and we're coloured. My mum thought that it was kind of something to do with racist *[sic]*, cos she never told off the other kids
>
> (Mixed heritage: school B, year 6, LA)

This episode suggests that ethnicity played a role in the representation Dominic had in 'being identified' by the teacher. Both in the context of the story and in real life Domonic matched his self-identity to a low achievement in mathematics. However, Domonic was keen to express this was compensated by achievements in other areas of his schooling like literacy and sports.

In the projected stories of the identity task the teacher's extended identity of the 'bad at maths' character was not rigidly given a negative representations. Instead, some of the storytellers in the sample drew on the ways in which the teacher would highlight the potential to do well, leading the child to identify itself in positive ways. In chapter four, the data from the children's analysis of achievement revealed that low achievers did not necessarily recognise themselves as such, especially in the year 2 sample. Table 20 also showed that positive teacher identification of the character is loaded more towards the year 2 sample. Being identified by the teacher according to positive traits like hard work enabled the child to establish a self-identification of competence.

This section of the chapter has explored how 'being identified' by the teacher in the story is represented by the storytellers in the study. The findings suggest that children who are classified as low achieving in real life did not always identify themselves with the 'bad at maths' character in the story. Using this projective task as a window to understanding the child and their representation of achievement one can intimate that, like Amira, the children can hold a misunderstanding of how the teacher really identifies them. The next section will explore 'self-identification' and explore how it is that some of these children come to misunderstand the representation of their level of achievement held within the school community.

5.5.4. Self-identification

In the previous sections on 'identifying the other' and 'being identified' as part of the child identity task, some examples of self-identification have occurred. One important question raised is what extent do the high and low achiever storytellers sampled relate themselves to the 'good at maths' and 'bad at maths' characters in the stories? Moreover, why have some of the storytellers chosen to identify themselves as such?

The following table shows how the storyteller's own self-identification related to those of the characters in the story. There were three possible forms of identification between the storytellers and their characters: (i) the storyteller identifies with the 'good at maths' character, (ii) the storyteller identifies with the 'bad at maths' character or (iii) the storyteller described how they were a mixture of both the 'good at maths' and 'bad at maths' character. This data is particularly interesting when it is matched with the storytellers' actual level of achievement in mathematics provided by the teachers. Also shown in the table is a breakdown of the figures relating to the children's year group.

Table 21. Storyteller's self-identification with the character's in their stories

	High achieving storytellers	Year Group	Low achieving story tellers	Year Group
Identifying with the 'good at maths' character	9	Year 2 x 5	**6**	Year 2 x 4
		Year 6 x 4		Year 6 x 2
Identifying with the 'bad at maths' character	**1**	Year 2 x 1	2	Year 2 x 1
				Year 6 x 1
Identifying with a mixture of both characters	5	Year 2 x 2	4	Year 2 x 1
		Year 6 x 3		Year 6 x 3

The figures highlighted in bold reveal those most interesting identifications between the storytellers and their story characters. Firstly, how is it that low achieving children had a self-identification that matched the 'good at maths' character in their story? One of the clues to answering this question lies in the higher proportion of the year 2 children (N=4) represented in this category. All four of these children used the communications with the teacher as a means of identifying themselves as a successful mathematician. These children reported that they either had a lot of 'ticks' in their books, or that the teacher had told them they had done well in their lessons. This was also the case for Amira (Pakistani: school A, year 6, LA) who told me that her teacher (Mary) had praised her. The other year 6 child in this group, Adam (Mixed heritage: school B, year 6, LA) simply said that he enjoyed mathematics and this helped him form a positive self-identification of his success in the subject. The other figure highlighted in bold is

the high achieving storyteller who identified himself with the 'bad at maths' character. Upon further enquiry as to why he associated himself more with the 'bad at maths' character, it became apparent that he extended an identity to those classmates who he thought were better at mathematics than he was, which led to an increased levels of poor self-identification.

It was described in section 5.5.1 how all the mothers of the 'good at maths' character were identified in a positive way. Dale (White British: school A, year 6, LA) was used as an example of a child who gave the character in his story a positive mother. Like many other children in the sample, Dale used this 'real' aspect of his home life in his own story, echoing a self-identification formation. The negative experiences of Saeeda and her difficult home life were also reflected in her story. These examples indicate that during projective tasks, such as the child identity task, the technique does provide a window to the child's representation of their world.

Take Dominic, who preferred to align himself with the low achieving character because he represented the home of the character as a happy one, just like he identified his own in real life. Furthermore, Domonic explained to me that he liked his self-identification with the 'not good at maths' character for the following reason:

> Domonic: I would say its better not to be, it's better not to be good at maths, than you are at maths, cos if you're not good at maths then you learn better

Domonic was the only child within the sample who drew on positive aspects of his self-identification as a low achiever in mathematics. His internalisation of this identity was also very salient.

All of the storytellers reported that the main character that was 'good at maths' would like school and mathematics. Likewise that the 'bad at maths' character disliked school because they found doing mathematics informed negatively on their general feelings about school, although one storyteller insisted that the character liked school but just disliked mathematics. The 'bad at maths' character, in many instances was portrayed as having other positive attributes such as being 'sporty', good at art or literacy. Overall, the life of the 'bad at maths' character was perceived as a struggle in general "everything is hard for her" or in certain aspects "doesn't like school that much but likes it at home; normal life".

On the whole the identity task revealed that children's representations of a high or low achievement in mathematics affects many aspects of the character's life. The identity of a learner is projected to their life with friends and family, often along seemingly positive and negative dualities. In a similar fashion, the characters in the stories are identified by the teacher in accordance with high or low achievement, although the teacher's subsequent treatment of the character was variable. Finally, the character had internalised the identity extended by the teacher, since all the 'bad at maths' characters were aware of their deficiencies with the subject. Most importantly, the storytellers actual achievement bore little reflection on the depiction of the life of the characters in the story. One might

expect that the low achieving children would paint a less negative life for the 'bad at maths' character, but this was not the case. At times, storytellers who were high achievers were more sympathetic to the 'bad at maths' character than their low achieving counterparts. As previously touched upon, the child identity task, arguably facilitated an understanding of the representations of high and low achievement in mathematics that did not otherwise emerge in the main child interviews. For example, there was a tendency among the ethnic minority pupils sampled to focus on family pride and support at home as a positive representation of home learning more than the White British pupils.

5.6. Discussion

The data in this chapter has revealed how the three levels of 'identifying the other', 'being identified' and 'self-identification' are interactional processes used to negotiate a way of perceiving ourselves within multiple communities of practice. Moreover, that these levels of identification can occur simultaneously and at different times in different contexts (as suggested by Dien, 2000). For example, Shazia was able to use her representation of her own Pakistani community to cement a self-identification that was different. In light of this it is possible to see how individuals do not necessarily use identity as a means of establishing a shared way of perceiving their community, but as a means of asserting change. Another example of simultaneous levels of identity being put to use were seen in Monifa's narrative. The job roles of Monifa's parents feature in elements of 'identifying the other' and 'being identified' because she understood

what counts in the achievement of mathematics, while at the same time influencing her own identity.

Significantly, it is important to recognise the unique way that change is as much a part of identity construction as stability. Individuals are not merely receivers of a community's representations. This is where coupling becomes a useful theoretical concept. Individuals have the potential to borrow or resist extended identities imposed upon them by the communities they inhabit. This chapter has provided examples of instances where hybrid identities have formed which have been borrowed from two communities of practice, indicating the emergent importance of the transition process between the home and school communities for the child learner. Monifa, for example borrowed mathematical strategies from home and school but tended to use home as her main source for self-identification of high achievement. Shazia too revealed a hybridity in her formation of identity in her self-identification, which combined her experiences within the Pakistani Kashmiri community and the British school system. Her experiences growing up in the British school system and as a teacher in Britain had influenced her engagement in mathematical activity with her own children. In the section on parental identity Rajesh's mother indicated that as a second-generation Indian woman she had established three identities that were 'not English', 'not Gujurati', but something 'in the middle'.

Overall, using these levels of analysis has provided some evidence towards understanding how powerful the construction of achievement is in the formation

of identity. For Monifa, the construction of her achievement identity was given a cultural status, however the data from her interview also holds implications for other ethnic minority children and White British children, whose own identity could be closely tied in with notions of achievement, but might not necessarily be associated with culture.

Before moving on to the next chapter on representations of practice it is worth making one final note about the data in this chapter. For the ethnic minority participants in this study, issues of culture held more saliency as an explanation for behaviour over other explanations such as social class. The reverse is true of the White British participants, whose lack of mention about culture is conspicuous in its absence.

The next chapter will focus on two aspects of representations of practice: (i) the engagement in mathematical activity and (ii) representations of past experiences.

Chapter six: Representations of practice

6.1. Representations of practice

This chapter is going to analyse two different aspects of practice: (i) the implicit and explicit engagement in mathematical activity at home and (ii) the representations of past experiences as they inform current practice. At this juncture it is important to theorise about the definition of practice that has been adopted in this programme of research. In chapter two, practice was described as 'learning by doing' by Wenger (1998) and was said to encompass more than just the undertaking of an activity. The discussions by Miller and Goodnow (1995) have also been most useful in extending the focus beyond the purist understanding of the concept of practice as an 'activity' to include actions, which are also meaningful and in the context of cultural and social contexts. In short, Miller and Goodnow (1995) offer the following definition of practice:

> Practices are actions that are repeated, shared with others in a social group, and invested with normative expectations and with meaning or significances that go beyond the immediate goals of the action (pp. 7)

The first half of the chapter will seek to understand the kinds of numeracy activities parents and children told me they engaged in at home; as well as addressing the kinds of activities teachers perceived parents should be doing with their children out of school. The communities of practice framework described in

chapter two defined practice as 'learning by doing'. This is a particularly pertinent way to think of home numeracy because numerical practices can be embedded in the course of everyday social practice to such an extent that the members in question (in this instance, parents and their children) have little or no awareness that they are engaging in number based activities. Bearing this in mind, two analytical concepts have been borrowed from Street, Baker and Tomlin (2000; 2001) known as explicit and implicit numeracy practices, to help understand parents' representations of their engagement in mathematical activity in the home community. Explicit numeracy practices refer to those activities which the individual is aware contributes to the learning of the subject. Implicit numeracy practices refer to those activities which may contribute to the child's mathematical learning, but are less salient in being recognised as such. There are two important questions to raise within the first half of this chapter: (i) how is home numeracy represented by the parents, teachers and children in the sample? And, (ii) in what ways do these practices differ?

The second part of the chapter will explore the ways in which history acts as a mediating force in the social and cultural practices of the present. The general aim is to understand in what ways the representations of the parents' and teachers' past experiences act as a mediational tool for understanding the child's current engagement in the practice of learning.

6.1.1 Parental representations of mathematical practice in the home community

In the exploration with the interviewees of their home mathematical practices, four aspects of home learning were discussed: (i) homework, (ii) 'game like' activities (iii), practical activities and (iv) mimicked school based activities. The concepts of explicit and implicit practices were evident in the kinds of activities that parents described they engaged in at home with their children. For some parents, even the subtlest use of number at home was viewed as explicitly helping the mathematics learning. For other parents, engagement with numeracy was undertaken but not recognised by the parent as helping to learn mathematics (i.e. implicit). Other parents did not appear to be engaging in explicit or implicit practices at all.

Homework

Chapter four discussed how parents, teachers and children construct meaning around the notion of homework, and the issues it raised for them on a semantic level. This section will examine the types of numeracy homework parents discussed as part of their discourse. Homework is an explicit form of home mathematics learning because, certainly from a schools point of view, it is an expected part of home numeracy following the educational reform brought about by the National Curriculum and the National Numeracy Strategy. It does not necessarily follow that parents understand every aspect of what is contained in the homework. However, as discussed in chapter four, homework can be difficult part of the home learning experience for some parents and their children. For other

parents the homework situation was relatively uncomplicated. This section explores what aspects of the homework scenario increased or decreased the level of potential conflict.

This first example reveals an instance where the change in mathematical discourse as a result of the introduction of the National Numeracy Strategy, was unknown to the parent. Michael's mother was asked to practice 'number bonds' up to 20 with her child[1]:

> Sarah: Did you understand all that was required of you, like practice number bonds up to 20?
>
> Michael's mother: No I didn't actually. I didn't know what number bonds were, but he [Michael] told me
>
> (White British: school A, year 2, HA)

It is possible to see from this quote the strategy for coping with those times when she did not understand the school mathematical discourse, which could be said to contribute to a decrease in the potential conflict of the situation. As a competent mathematics learner Michael was able to tell his mother what the teacher meant by number bonds, once again reinforcing the role of the child as the mediator in the transition between the home and school community. However, this level of competency on behalf of Michael could be associated with being a high achiever. The difficulty with this position comes about when the child is unable to explain to the parent how to do a particular mathematical homework problem. Lee's

[1] Number bonds are the combination of numbers which round off to the nearest 10 (e.g. 6+4)

mother (White British: school B, year 6, LA) recalled a situation where this had been the case, and her son had become very frustrated with the homework situation. Fortunately, Lee's mother was able to approach Chris (Teacher in school B-LA) to seek help with the problem. A similar scenario would have presented more problems for the year 6 parents in school A, who were not permitted to see the teacher without prior appointment. When this same scenario happened to Dale's parents (year 6, school A) the parents told me that they sent the homework back with their son and no direct contact with the teacher ensued. This can be particularly difficult if the child is a low achiever and struggling to understand the mathematics themselves. For example, Rajesh's mother (Indian: school A, year 2, LA) also mentioned similar difficulties she had with her son, whereby Rajesh recognised the mathematics he had done at school but explained to his parents that he hadn't understood it.

The same problem arises if neither the parent nor the child understands a particular area of mathematics. Rajesh's mother explained to me that she had problems helping her son with shape and space, so she tended to pass this homework over to her husband:

> Rajesh's mother: You know the rectangle and squares and stuff, I don't understand that so I leave that to my husband right, I can't get that. So when he gets like times homeworks, adding homeworks, take away, clocks and basic like, I can understand all of that. But when it comes to rectangle and hectagon *[sic]* and all that, right, that really gets me so I

> leave that to my husband. But **I do know it but I don't want to get it wrong for him so I'd rather leave it on to him, right.**
>
> (Indian: school A, year 2, LA)

Upon initial interpretation of this quote one might suggest that the lack of knowledge about the topic of shape and space in mathematics related to this mother's cultural representation of what counts as mathematics as a result of being an ethnic minority parent. However, Rajesh's mother, as a second-generation immigrant was educated as part of the British school system. Another explanation must be sought and one interpretation relates to the changes in educational reform from the education of the parents to that of the children. Shape and space is perhaps the most abstract form of mathematics that the school could send home, from a parents' perspective. There is a historical significance to the above quote in that the present generation of parents is unlikely to have done much work on the area of shape and space in their primary years. Parents are also unlikely to connect the use of shape and space to their current numerical activities at home in the present, compared to other mathematical functions like addition and subtraction.

The quote from Rajesh's mother raises concerns about homework that were expressed by Chris in chapter four about the kind of role the parent is expected to undertake in the homework situation. The text in bold indicates that Rajesh's mother expected that her own involvement in her son's homework to be based on a teacher-student relationship, which served to accentuate her fear of getting it wrong. Teachers' expectations are such that they hope parents are engaging in a

question and answer method for solving a problem, so parents don't feel under pressure to have all the answers. Changing the teacher-student representation of the homework scenario would require a large amount of redress in the parents' representations of the homework relationship between the parent and child. Michael's mother is fortunate that she has the kinds of skills that the teachers would like of parents. Furthermore, as this section of the chapter has demonstrated, more of the parents with low achieving children mentioned difficulties with homework than their high achieving counterparts.

Game like activities

The numeracy practices which parents mentioned most often were those that involved 'game like' activities. Parents showed three levels of understanding and awareness of the positive benefits of mathematics games: (i) making no use of maths games, (ii) making use of maths games but not recognising the benefits (implicit) and (iii) making use of maths games and recognising the benefits (explicit). A good example of the second level of understanding comes from Michael's mother, who found it hard to recall any games that involved numeracy that the family played at home but later listed a number of games that the family engaged in and which she hadn't considered as beneficial for developing numeracy skills:

> Michael's mother: Like you said today, what number games do we play with him and we haven't really, I hadn't really thought about that...he plays dominoes, he plays chess, he plays a lot of games with strategies
>
> (White British: school A, year 2, HA)

After the interview was over, Michael's mother mentioned that the family also played Monopoly and Snakes and Ladders at home.

A number of the parental narratives revealed that the pre-school years were a rich time to undertaking 'game like' activities with their children. Many parents used 'game like' activities as the main type of activity for helping with their child's basic counting skills. The games parents referred to were, counting baby-grow poppers, counting building bricks, dot-to-dot drawing books, counting stairs, looking at number fridge magnets and counting cars or buses. The parents of high achieving children tended to report a more diverse range of pre-school activities than the parents of low achieving children, who were somewhat vague on the examples they gave me. The following quotes are from parents of low achieving children after they were asked to comment upon the types of number based activities they had done with their children when they were young:

> Amy's mother: Can't really remember actually [long pause] probably, I don't know, I can't really think. We did have like days and that, and we had a number one. I think I remember having books with like one to ten in, whatever
>
> (White British: school B, year 2, LA)

> Dale's mother: I mean we used to get him to count up his fingers and if, then count up this toes to get him up to 20 and that type of thing when he was younger. But, probably pre-school, nursery
>
> (White British: school A, year 6, LA)

> Rajesh's mother: We've always like done things, but not purposefully done things. Like we've always taught them education like 'this is a table, and that is a thing'...so it's just like basic everyday things like you go to the supermarket and they see things like Monsters Inc [children's film]
>
> (Indian: school A, year 2, LA)

There is something qualitatively different about the two former quotes from the White British parents, compared with the quote from Rajesh's mother. The kinds of practices that the White British parents engaged in the their pre-school children, while a little vague, were still explicitly numerical. The parents clearly recognised the explicit benefits of doing these activities. Rajesh's mother, on the other hand, despite knowing that the context of the interview revolved around mathematics, used the questions frame around educational activities to emphasise knowledge about the world around. For this mother then, pre-school activities were focused on 'real-world' learning as opposed to school-based learning. Unfortunately, this particular cultural representation about what counts as learning for a pre-schooler does not match the expectations of the school community or policy guidelines for the type of knowledge that a child should start school with.

In the paragraph above it was suggested that the parental descriptions of the pre-school numeracy activities of the low achieving children were vague. It is clear here from these quotes that numeracy had been a part of these children's pre-school years but it is only when the activities are contrasted with the descriptions

from the parents of high achieving children that some differences become apparent.

Jennifer's mother recognised the benefits of playing numerical games at home, thereby making what could be an implicit practice an explicit representation of positive home learning. Jennifer's pre-school years were described as rich in mathematical experiences:

> Jennifer's mother: We taught her counting from when she was tiny we used to count steps going up stairs and how many cups, like most parents, well I suppose it's not like most parents because a lot of kids don't. So she had a good grounding before she even went to school
>
> (White British: school B, year 2, HA)

She described the many different pre-school activities they engaged in as 'natural', despite the fact that she was fully aware of the advantages of these kind of practices. This makes the notion of explicit and implicit practices quite complex in that, on the one hand as a parent this mother perceives pre-school activities as an implicit part of home learning, but is also acutely aware of the advantages of games. In a similar vein, Michael's mother described his early experiences with numeracy as a normal part of being a parent

> Michael's mother: Well [there are] the building bricks aren't there, everybody has building, counting
>
> (White British: school A, year 2, HA)

For some parents, pre-school numeracy games were not an obvious or meaningful practice to engage in at home. Rajesh's mother spoke to me about the problems she faced when Rajesh started school because of her lack of knowledge about the expectations from the school in terms of his pre-school learning:

> Rajesh's mother: Cos the problem with him right, was he never really started reading or writing till he went to school. The problem right, I had a few problems then so I never really understood when they should start writing or reading to tell you the truth right. And when he started school they were like 'oh, he can't read and write' and then I thought, I didn't really know I should have taught him or not, nobody really explained it to me.
>
> (Indian: school A, year 2, LA)

Although Rajesh's mother has veered away from the topic of numeracy in her discourse about home learning practices the quote still has a relevant message. The notion of implicit and explicit practice is also relevant to literacy research and this mother gave no indication that her representation of practice was any different for numeracy.

It is important to note that out of the eleven ethnic minority parents interviewed, three were vague in their recollections of pre-school numeracy activities. Rajesh's mother was one of them and she has already been discussed in depth. The other parents were Fazain's mother (Pakistani: pilot school, year 6, LA) and Amira's mother, (Pakistani: school A, year 6, LA) who both described their children's early years educational activities starting when they began school at five years

old. Notably what these parents have in common are low achieving children. Furthermore, all three of these parents were either first or second-generation immigrants to the British school system. While other first or second-generation immigrants were able to describe in detail both explicit and implicit forms of home numeracy practices, these parents could not. This leaves a question mark about why these parents in particular held the kind of representations of home numeracy that they did. This could be related to the parents' representations of their own past experiences of schooling, which are going to be discussed later on in the chapter.

Engagement in mathematical games in the present

Numerical games clearly played an important role in many of the children's lives in the years after starting school. The types of games the children played included board games, card games, dominoes, darts, and some sports related activities, which required scoring. However, there were exceptions to this. Rajesh's mother, an Indian parent of a low achieving child in year two (6/7 years old) still utilised dot-to-dot books as the main home numeracy game. For the other parents in the sample who mentioned using dot-to-dot books as an explicit aid to numeracy learning this was a pre-school activity. Rajesh's mother had a different representation of what numeracy kinds practice was useful to her son's education at his stage of child development; so where most children had left dot-to-dot games in their pre-school years, this was the type of game Rajesh was playing at home.

The day-to-day practicalities of doing 'game like' activities can be very difficult for some parents. Two of the parents (Rajesh and Amy) explained that younger children made it hard to find the time and energy to engage in 'game like' activities at home. Rajesh and Amy (White British: school B, year 2, LA) had board games and card games but they didn't appear to be used for the purpose they were intended. When I asked Rajesh's mother if he had any board games she answered:

> Rajesh's mother: He's got some but I've never had the time, it's like I have to get the time to do it with him and it's a bit difficult trying to juggle everything
>
> (Indian: school A, year 2, LA)

> Amy's mother: Well I did get like puzzles and all Letterland[2] stuff...but I must admit she doesn't like take care of the stuff...she has like snakes and ladders and things like that but stuff gets lost, we play a few times, then she'll play with it on her own and you never see it again
>
> (White British: school B, year 2, LA)

The quote from Rajesh's mother indicates that she did not have a representation of mathematical games forming a meaningful practice as a tool for learning numeracy. This may be one of the reasons why she had not been able to make time for such activities as part of their busy home community life. Amy's mother clearly has an understanding about the explicit uses of home games for learning

[2] Letterland is an educational aid for learning literacy

mathematics because she needed no prompting in the interview to name some of those games. However, the quote above indicates that it was not a shared activity sustained in the home with all the family. Time to undertake some of these activities was an issue for other parents with the pressures of everyday living and work commitments. In some of the families grandparents played a useful role in the 'game like' home numeracy practices that some of the children engaged in. This was particularly the case for Anthony (White British: school B, year 6, HA) whose parents enthused about the explicit benefits of board games and card games for their son, but did say that he spent a considerable time playing these with his grandparents.

The parents of high achieving children unanimously reported on an enthusiasm that their children felt for 'game like' activities that were not always shared by the low achieving children. Dale's parents revealed that their attempt to use games for learning mathematics at home had failed. Here she told me the difficulties she had trying to get him to engage:

> Dale's mother: He's got board games and things like that but he looses interest very quickly in them, and again for that reason we used to buy a fair amount of educational games but trying to get him, he's too clever in the sense of the word, he's too astute because he realised they were educational rather than just fun
>
> (White British: school A, year 6, LA)

There is something complex taking place here that would cause this child to reject an activity that is perceived as school-based. Dale's history revealed that his early primary years in another school had been quite difficult and this may have led him to reject other aspects of his school-based learning.

Technology, in the form of educational computer games, also played an increasingly important role in the lives of school children. Over the preceding two decades there has been a dramatic increase in the use of computer games as a means of learning numeracy and this contrasts sharply with the school and home experiences of the parents. Eleven of the twenty-two parents mentioned having computer games for their children, which had a numerical content in them[3]. Interestingly, there was a developmental element to the use of numerical games for the computer with seven of the year 2 parents mentioning these activities compared to four of the year 6 parents. This is indicative of the current stance of the retail market for numerical computer games for children, whereby key stage one children (ages 4-7 years) are well catered for, whereas computer software for key stage two children (ages 7-11 years) revolves around the SATs examinations. The four year 6 children who did engage in numerical games on the computer did so through the Internet on specially designed websites with numerical games like mock casinos where they could pretend to gamble with money. The exception to this rule was Monifa, whose father's job role as an I.T. consultant[4] meant she had significant use of the computer for practicing home numeracy. Her father was

[3] This analysis does not include computer CDs designed to test for the SATs examinations which would be considered 'mimicked school based activities'

[4] The job role of Monifa's father had an influential impact on her sense of identity and was discussed in the previous chapter.

actually developing a mathematics website and would use Monifa as a subject to test the site:

> Monifa's father: So, I'd open up this site and I'll be taking them through things like surface area, or circles, or rectangles, volume. Say if somebody want to paint this room, if he spends £5 painting that, how much will he spend painting the whole room, when you take windows out and doors out, and just general things like that.
>
> (Black African; school A, year 6, HA)

The quote above reveals that Monifa is engaging in complex mathematical practices (like shape and space), which are on a level of sophistication not mentioned by other parents. Furthermore, although Monifa's father described the website as informal it appeared to resemble a practice similar to that of school.

Two of the parents in the sample actively discouraged the use of game like activities on the computer for their children. The next quote reveals why Rajesh's mother did not think the computer was a suitable medium for learning numeracy:

> Rajesh's mother: I reckon writing is more important than on the computer. I've always thought that, like my husband said, he got that kiddies computer thing right, and I said 'no, I think he should learn this, that he can learn anytime in life' that you can learn, but to learn this again is harder than to learn the computer thing. Do you know what I mean? At least by writing he know what the '5' is
>
> (Indian: school A, year 2, LA)

This quote demonstrates that Rajesh's mother holds a representation of a particular type of learning. She had not connected the possible usefulness of using the computer in combination with numeracy. This has some historical significance in that many of the parents in this study, having had no school experience of using the computer in conjunction with numeracy learning, would not realise the usefulness of combining the two practices. This is not the case in the school community, where teachers and children are encouraged at an institutional level to use the computer as a mediational tool for improving numerical skills. The second parent who restricted the use game like numeracy on the computer told me:

> Dale's mother: A few years ago I bought no end of computer programmes and that sort of thing, he'd sit at them for a couple of minutes and then he'd get bored...It tends to be his Playstation that he plays more than anything, cos we don't allow games on the PC computer because we want him to get into the idea that the PC is for working on, not for playing games on
>
> (White British: school A, year 6, LA)

This parent raises two issues in the context of her discourse about her son's computer learning. Firstly, she describes how she has tried and failed to get her son to engage computer programmes for learning. Secondly, and maybe as a consequence of her initial failure to get her son to engage, she has made the computer into a formal tool. Formalising the computer may have then reinforced his alienation from it as functionally enjoyable.

Practical numeracy activities

Home numeracy practices that had a 'practical like' use were raised in all the parent interviews analysed for this study. By 'practical' it is meant that numeracy is incorporated into everyday activities that require the use of mathematics. The parents mentioned playing shops, cooking and more than anything else, spending and counting saved pocket money. All except two parents spoke about their child's use of money in real-life settings. Most commonly, children were sent to their local shops for the newspaper, sweets or for groceries and were specifically asked by the parents to check the change before coming home. Many of the children saved and counted their pocket money. The two parents who, when questioned, did not use money as a tool for learning numeracy were both White British and had children in school B. Amy's mother gave her daughter money to hand over to the shop assistant, but it is possible to see from the next quote that the experience was not used in a concrete way:

> Amy's mother: Yeah, she does pay the lady in the shop, I give her money then ... I should do that a bit more
>
> Sarah: Does she tend to, when you do that, does she add that up herself or does she give the change and have it back?
>
> Amy's mother: I don't think she thinks about it much, she just loves the money. I think she would know the basics of what they are
>
> Sarah: You mean what each coin means?
>
> Amy's mother: Yeah, she's never very good, if you took twenty pee away from fifty pee she wouldn't know I don't think
>
> (White British: school B, year 2, LA)

This quote raises an important question about the usefulness of implicit numeracy practices if they are not used in such a way that requires the child to undertake a numerical operation. The other child whose mother said she did not use money was Natasha (White British: school B; year 6, LA).

There was one parent who described how money was used in both the context of 'real' shopping and was also given money questions to solve at home. The next quote is a nice example of a parent explicitly using money as a learning tool for mathematics learning:

> Amira's mother: Sometimes she [the mother's sister] gets them to write a shopping list and she'll ask me to go in that shop and ...she'll ask 'Amira, if this costs this much, this much and this much, how much do you think you're gonna need, roughly, I'll give you a couple of pound extra in case', I get her to do that type of things
>
> (Pakistani: school A, year 6, LA)

Why then should this child, despite the parent's efforts to incorporate explicit practices into everyday activities, be classified by the teacher as a low achieving child? One problematic part of this analysis is that while it explains the kinds of the activities that parents and children engaged in, it is still based on parental representations of the practice. Just because a parent mentions a practice it doesn't necessarily follow that it is a regular part of the home learning.

Mimicked school based activities

After games, parents' narratives were dominated by examples of 'mimicked school based' activities. Mimicked school based activities are like the kind that would be undertaken in the school community, but did not come from the school. One prevalent strategy for mimicking 'school like' numeracy involved shop bought books, which reflected the type of mathematics the children came across in the statutory school exams. James' mother told me:

> James' mother: We have got some books that we bought; I think they were Letts[5] books, for children aged 5-7, and there's ones on adding and subtracting and multiplying and all this kind of thing. We've given him a number of those to do.
>
> (White British: school A, year 2, HA)

The prevalence of shop bought books in these parents' homes characterises their expectations of what homework should be like for their children. This is particularly true if the teacher takes a game oriented approach to home learning, which the parents find hard to connect with.

Other 'school like' practices included buying educational aids like counters, times tables books, flash cards and producing worksheets which are like the ones that come from school. Some of the parents had become very skilled at making explicit numeracy practices, like learning times tables, into a practice which the

[5] Letts is the brand name for a company that produces educational aids like shop bought books for learning

child did not realise he is implicitly part of. The practice then becomes incorporated as an everyday part of the home community. Michael's mother told me:

> Michaels' mother: We were doing tables on the way to school because part of my way of educating him is to incorporate that at different times of the day. So not to say 'we will sit at the table in ten minutes' well we do say 'we'll sit at the table in ten minutes' but not always to do it that way. So if an opportunity arises then, so sometimes on the way to school, or any time when I'm cooking a meal I'll say to him 'Michael, what's five, nines?' and he actually seems to respond quite well to that. Doesn't appear to be pressured by it or phased by it at all. So that's what we tend to do.
>
> (White British: school A, year 2, HA)

Another home numeracy practice, which was fairly prevalent among the year 2 parents, and some of the parents of low achieving children in year 6, were parents making up their own sheet of sums for their child. Quite often these calculations were not as complex as the children would be doing in the school community. The quote below is an example of the way mimicked school based numeracy is undertaken in the home with probable limited effect on improving mathematics skills:

> Rajesh's mother: If it's something with maths he's not happy with he does it himself on his thing. Like he just does it, like I say 'come on Rajesh you know you couldn't do those add sums, make some up yourself and do them' and goes 'fine' so he goes upstairs and does it playfully

(Indian: school A, year 2, LA)

This is where the link with homework as a meaning construct becomes influential. A lack of consistency in the numeracy homework can lead to parents becoming increasingly out-of-touch with the practice on a weekly basis. Amira's mother (Pakistani: school A, year 6, LA) is an example of a parent who also resorted to mimicked school based numeracy to compensate for what she perceived as a lack of homework from the school.

Out of the twenty-two parents, seven mentioned using school based numeracy frequently at home. Out of those seven parents, four were high achieving children. However, what sets the low achieving and high achieving parents qualitatively aside is the tendency among the high achieving parents to use school-based numeracy in conjunction with other tools like games. The parents of low achieving children relied on the formal and explicit types of numeracy, like homework and shop bought books.

It has begun to emerge in this chapter so far that practice in the form of engagement in mathematical practice is qualitatively different for many of the low achieving children than it was for the high achieving children. Parental descriptions of practices in the early years and indeed, in the present, appeared vague and nondescript. Even if these parents were aware of the explicit usefulness of games they did not appear to utilise them as a learning tool to the extent that many of the parents of high achieving children did. Particularly notable was the

example of Rajesh's mother whose representation of home learning, particularly in the pre-school years focused on 'real-world' knowledge (such as being able to name a table). She was only able to realise how problematic this was when her son started school and she found out the expectations of the school community were very different to her own.

Ethnicity did appear to play a role in the engagement of mathematical activity at home, although over-generalisations should be avoided. This section of the chapter has shown that ethnicity did have an influence on the kinds of practices some of the parents were undertaking with their children. Parents of the White British group appeared to utilise more implicit kinds of practices like cooking, games and pocket money. Those parents from White British or ethnic minority groups that tended to stick to more explicit forms of mathematical learning, like school based activities, held a different cultural representation of what counts as home numeracy. It is feasible to suggest at this juncture that these representations relate to some extent, to the past experiences of the individual. Also, as indicated by some of the quotes above, some kinds of numeracy practices often take more time, energy and creativity from parents and this is not always easy to manage in the context of everyday lives. It is these kinds of qualifiers, rather than the school that the child belonged to, which played a role in the kinds of numerical practices undertaken at home. If, as the chapter progresses, past experiences do play an influential in role in the current learning of mathematics at home this may explain why the child's belonging to a particular school has little bearing. In essence, the scene may have already been set even before the child was born.

6.1.2. Teacher representations of mathematical practice in the home community

It became apparent in chapter four that the home community and school community did not always share a representation of what counts as mathematical learning. Within this chapter it has been revealed that practices perceived as desirable by the school community, like games, are not utilised by every household, therefore, teachers' expectations about the kinds of practices they would like parents to engage in at home will be explored. Like the parents, teachers mentioned the three main activities of: (i) games, (ii) practical activities and (iii) mimicked school based activities.

Game like activities

Three of the eight teachers mentioned using games for learning during their interviews. Catherine and Richard focused on two developmental issues pertaining to the use of such activities. Catherine returned to the pre-school years in her discourse about game like numeracy:

> Catherine: I mean that's what makes these children better mathematicians, better at anything. That from day one when they were tiny babies you start doing counting their fingers and counting their toes, and doing things like that....you know, going up stairs and counting
>
> (school A, year 2, HA)

Catherine assumed a direct association between the high achieving children's early years experiences and their success in mathematics at school.

Richard's discourse surrounding development looks at a trajectory of an older child:

> Richard: I think it's the games parents do play with their children, so I think if you're constantly playing; I'm amazed how many children in this class can't add up dice by just looking at the, they still count the numbers. I'm used to eleven year olds who can just see the dice and know, just looking at it, they know it. And this quite shocked me in year 2 that we're still counting the dots and I had no concept of that. And I think that if you're playing a lot of dice games at home you're going to recognise the dice without counting.
>
> (school B, year 2, mixed)

What is most relevant about his quote is the expectation that numeracy games would be part of the home community. His representation of these kinds of numerical activities may be particularly vivid because of his own experiences as a child. Once again, this is explored in a later part of this chapter relating to representations of past experiences.

Anna's analysis of the use of games at home is more sceptical, particularly for numeracy:

> Anna: Do these parents also play games, and if they play games, what type of games is [sic] it? Do they play card games or is it always Scrabble [a literacy game] that they play? You know, and I just wonder if also, I

> don't know maybe for speed it's easier to do it yourself rather than letting a young person work it out or tot up how many points you have got. And I think it all depends on that and I think so many games are geared to either social skills like taking your turn or language based, really.
>
> (school A, year 6, HA)

Anna's quote raises an important issue about many of the practices at home involving numeracy. Engaging in any kind of implicit numerical activity is only useful if the child is given a chance to engage in their own reasoning about the operation and conduct their own calculations.

Practical like activities

In their expectations of parents, teachers listed very similar practical activities as the parents, which they perceived as ideal for the home community. Shopping and the use of money, and cooking were obvious choices. One added activity, which teachers wanted parents to engage in, and which only one parent mentioned, was telling the time. Teaching children how to tell the time in the classroom was both complex and time-consuming and parental help at home alleviated some of this pressure on the teacher. However, learning time at home is problematic on two counts because not all parents either have the right tools or skills to help their child with time telling. Catherine, in her interview made the point about having the right tools in the house to aid teaching:

> Catherine: We even get the trouble with clocks, some children don't even have clocks at home. They'll have plenty of videos and microwaves and

> things, with digital time on them, but they will not have an analogue clock in the house
>
> (school A, year 2, HA)

The second issue, that of having the right skills is important because time telling requires complex teaching strategies because of the many different ways that time can be represented. The expectations on parents, therefore, viewed through Mary's discourse is very high:

> Mary: And telling the time, that's one of the worst subjects to teach and **it's the most difficult subject to teach because there are so many silly rules with it.** And **if parents are more involved with that, then that's helpful** and a lot better for the child...I think a lot of reinforcement needs to be given at home, especially with things where you do need one-to-one guidance. Things like learning tables and just general practice with money and things where you can't really do that in the classroom so easily because it takes up too much time and its one-to-one work
>
> (school A, year 6, LA)

Mary openly admits that teaching time is difficult but would still like parents to be involved in this aspect of the mathematical learning. Parents in this light are being used as substitutes for a lack of time to teach at school. Not every parent has the kind of skills necessary to teach complex and time-consuming mathematics, thereby increasing the gap between the parents who can and those who cannot. Furthermore, if only one parent mentioned telling the time as a home activity this

suggests it is an implicit practice. Of course it is recognised that even though parents did not mention time telling, it does not necessarily follow that the activity was not part of the home learning.

Jane realised that these practical activities were not useful if they are not utilised in the right way:

> Jane: You need a parent who does lots of nice things, cooking cos that's measuring. A parent who does the everyday things but talks about it with their child. The parent who just does it and never involves the child...who never says to the child 'ok, tell me how much is there, right lets see if we can match it on the scales' it's a big difference between the parents who does and parent who involves the child.
>
> (school A, year 2, LA)

Practical activities like cooking require some creativity on behalf of the parent to make the most of the benefits of mathematics. Furthermore, Jane wanted the parents to converse with their child about the mathematical content of the activity which requires two provisos, one being that the parent must recognise the activity as explicitly helping with numerical learning and also, using the activity to extract a very particular type of information.

Mimicked school based activities

The school-based activities, which teachers were most keen for parents to be involved with were learning times tables. Times tables have been classified as

school based learning because they are a form of mathematics that is explicitly driven by school. Times tables are not an activity which one undertakes anyway, like cooking, that by chance happens to incorporate mathematical operation. Furthermore, learning times tables tends to rely on rote techniques which are arguably related to a particular type of school based approach. This is supported by Mary who said:

> Mary: It's very difficult for a child to sit down and learn their tables and yet it's the only way to actually know them, by rote learning really. Um, and so I think, that's important and that's where support is really useful.
>
> (school A, year 6, LA)

Interestingly, parents felt that the school community did not practise times tables enough, and this was frequently raised as a cause for concern. The call for increased levels of involvement of parents in their child's learning on a political level has led to a situation where there is confusion over levels of responsibility between the home and school community.

In summary, the teachers in this study had a range of expectations about parental involvement in home learning. Mary, for example, had high expectations about the kinds of activities parents could help with, while at the same time talking about the inherent difficulties in trying to teach certain types of mathematics. One area of concern worth noting from a teacher in this section is the quality of the involvement from parents. There is not necessarily a direct link between taking

part in a practice like a board game and using that practice as an explicit tool for improving school numeracy skills.

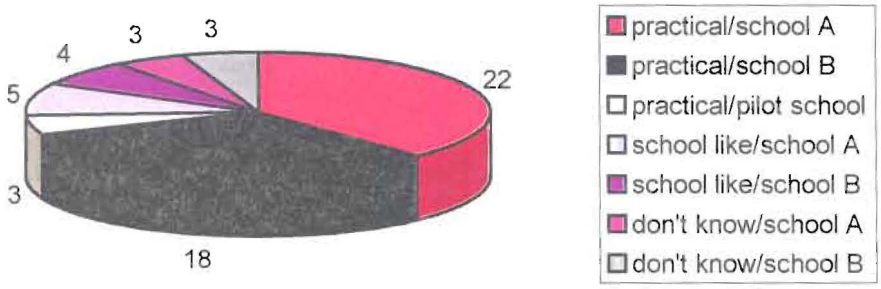
6.1.3. Children's representations of mathematical practice in the home community

One of the issues raised by educationalists and pupils alike when addressing school mathematics learning is the relevance of the school based activity to real life. Part of the curriculum introduced in the National Numeracy Strategy has tried to incorporate 'real life' mathematics into the classroom practice. This usually took the forming of problem solving, whereby children were asked to solve mathematical questions with a real-life content (Cooper, 1998). Despite this change in the curriculum, it still remained to be seen whether the children were able to see how mathematics applied to everyday situations.

The children were explicitly asked about the use of mathematics in everyday life. A large proportion of the children were able to understand how mathematics could be used in everyday life, listing money, jobs, shopping, cooking, decorating and paying bills[6] as part of this. The following diagram gives a breakdown of the number of children who mentioned these 'practical like' activities in relation to everyday mathematics. Those children who mentioned 'school like' numeracy such as homework for everyday mathematics are referenced accordingly as are those who didn't know how mathematics could be used as part of everyday life.

[6] These activities have previously been listed as 'practical like' and will continue to be used as such here

Table. 22. Children's understanding of everyday mathematics according practical or school like representations.



The significant aspect about this finding is that all of the year 6 children recognised that practical activities dominated everyday uses of mathematics. The children who mentioned school based activities, or weren't sure of the uses of everyday mathematics were in year 2. There were no patterns existing between the high and low achievers in the year 2 groups.

Revealed here is the increasingly sophisticated ways in which children can represent mathematical knowledge as they develop. Alternatively, children are socialised to understand mathematics in a particular way.

Discussion

Up to this point this chapter has explored home numeracy practices through the theoretical concepts of explicit and implicit mathematics borrowed from Street et al. (2001). Street et al. highlight both the explicit and implicit uses of mathematics in the home/school community, using the concepts of 'salience' and 'visibility' to

describe those numeracy practices, which parents recognise or deny as being related to numeracy. The concepts, while useful for trying to tease out more intimate experiences of mathematics in the home community are problematic in the extent that they overlap each other. A practice that is implicit to one parent may be explicit to another, or may be explicit for the parent and implicit for the child. This is perhaps the crux of the issue, in that parents of successful children share with the school community an understanding of mathematical practice that is both explicit and useful.

The ways in which parental practices differ suggestively relates to their cultural representations of what counts as a particular form of numeracy. One particular relevant example is the use of board games as a learning tool for numeracy. These representations must, to some extent, be influenced by the experiences in the individual's lives. Another example would be the utilisation of explicit or implicit mathematical practice before the child even enters school. Some of the teacher participants in this study told me that a common problem facing schools is the disparate level of mathematical knowledge that children enter school with, based on their early years experiences. Not all the parents shared a cultural representation of appropriate pre-school activities that would be advocated by the school, to engage in either explicit or implicit activities like numeracy games. Take Rajesh's mother who was shocked to find she should have been teaching her son basic skills before he went to school.

Furthermore, explicit knowledge of the benefits of certain home numeracy practices is only useful if the opportunity is taken to use the practice to aid mathematical reasoning or calculation. If the practice is not made concrete then the benefits may be minimal. There were two parents reported above who knew that money was a positive means of learning numeracy but did not utilise this opportunity.

The tools for using numeracy in the home have changed, such as the mediational role of computers. However, a lack of understanding on behalf of some of the parents meant that the computer was not always used to the best advantage. Combining different tools of representation requires a complex understanding of how one can work to the advantage of the other. Equally, one of the teachers considered that telling time created a breakdown in the representation of learning between the home and the school because some homes didn't have an analogue clock.

On a political level there is an idealised view that the home community is enriched with mathematical practices which supports and enhances those experiences provided by the school. However, the data from the teachers and parents suggests that this is not correct and there are a host of different mathematical experiences within the home community. Moreover, there is a greater prevalence among the ethnic minority communities to rely on traditionally explicit numeracy practices, which are considered by British teachers to be school based.

6.2. Representations of past experience

The first part of this chapter has explored parental representations of particular form of engagement in mathematical activity. It was tentatively suggested that part of the reason why particular individuals hold certain cultural representations of a practice relate to their lived experience from the past. This part of the chapter is going to explore the representations of the past experiences held by the parents and teachers sampled for the current research programme. More importantly, an attempt will be made to understand how these representations of past experiences mediate in the child's current school and home learning.

For the parents, the utilisation of past experiences to inform current practice followed positive and negative paths. Those parents who were content with their childhood experiences aimed to recreate them and this process is referred to as internalisation or reproduction. For others, it was a struggle to make the experiences for their children different to that of their own childhood. In this

instance parents undertook a process described as externalisation, which resulted in change to either the representation of, or undertaking of a particular practice.

The teachers also made use of their past experiences: (i) to inform their own teaching in the classroom, (ii) to inform the kind of teacher they wanted to be perceived as, and (iii) to reflect on their own achievements in mathematics. So like the parents, the teacher participants at times reproduced their pasts and at other times sought to change in their current practice what they had experienced.

This part of the chapter will initially begin by exploring the parents' representations of their past experiences in relation to their academic learning and the social influences at school, before moving on to the teachers.

6.2.1. Parents' representations of their academic related past experiences

In the interview parents were asked to reflect on their own achievements at school and into adulthood, and the circumstances that led to the decisions they made about their education (see appendix 8.2). Many of the meaning constructs that have been raised in previous chapters were connected or influenced in some way by the understanding of their own past, or in turn, by parents' notion of a projected future for their child.

The impact of parents' past academic experiences on their hopes for their children in the future

In the section of the interview relevant to this part of the chapter parents were initially asked to reflect on their own achievements at school and into adulthood, and the circumstances that led to the decisions they made about their education. The qualifications that the parents received are not the direct focus of the enquiry, what is most interesting is the quality of parents' decisions and how these experiences have affected their present and future projections for their children[7].

Parents reported a vast array of experiences from their pasts. Three of the ethnic minority parents had the most diverse experiences because they were educated abroad, and other ethnic minority parents recalled what it was like being first or second-generation immigrant. As the following data will reveal, one thing all the parents shared in common was a desire for their children succeed in the future, which could be reflected, not just in their academic level of achievement, but also in the child's level of emotional happiness and autonomy in the future.

Parents wanted their children to achieve to levels, which gave them options to do a job they were good at, a job their child had chosen to do and that was well paid. Three of the twenty-two parents interviewed were educated to degree standard or above, and out of those three, two of the parents expressed a desire for their own children to achieve similar results. Unlike the other parents in the sample, these two parents considered that a degree was the only way to fulfil the aspirations of a

[7] Parents' qualifications can be viewed in the profiles in appendix 8.7

good job that was well paid. One of those parents, James' mother, had spoken in the interview about an academic path for her son (i.e. GCSEs, A'Levels and a degree[8]) that gave some indication of her expectations for him in the future. However, the next quote reveals the conflict she felt about holding this representation of his future:

> James' mother: I don't want his academic, almost lack of ability to hold him back from doing whatever he might want to do. So, the formal educations important for that because in the world of work now, sadly, the first thing people look at obviously is your qualifications. So I'd like to try and encourage him, **but I don't want him to get so hung up on that, that if he fails in it, he thinks he's failed in life**, and that's a difficult one to find the balance on...I want to see him achieve the best he can achieve
>
> (White British: school A, year 2, HA)

Both of James' parents were educated to degree standard and her comments about the world of work reflect an attitude towards qualifications, which views them as a necessary, rather than desirable. Her uncertainty about his projected future arises because at this early stage in his education there was no guarantee that he would be able to achieve a level required for higher qualifications. Recognising this, she didn't want to push James too much, like her own father did to her (the influence of parents will be discussed shortly).

[8] GCSEs and A'levels are examinations required for gaining entry to UK universities

Monifa's father, who was also educated to degree standard showed similar emotional dilemmas to James' mother, believing that his daughter needed a degree to accomplish the kind of success he hoped for her while trying to 'dissociate' from his mind that she must have one:

> Monifa's father: I hope that she will have enough education to be self-sustained so that she can, she can, you know, take control of her destiny. I'm not, I used to, I've tried to dissociate my mind from 'she must have a degree'...but I would try, you know, to make her achieve at least a first degree or diploma or something
>
> (Black African: school A, year 6, HA)

These opposing thoughts were irreconcilable and his own educational values, discussed in the previous chapter, from his upbringing in Nigeria meant that he strongly regarded formal qualifications as a crucial necessity. This is an example of the way cultural identity, which was mediated through this father's representations of the 'value of success' was influenced from experiences in the past. More importantly, that he had deliberately tried to bestow the same representations to his daughter.

Although some of the other parents did not have high levels of formal qualifications themselves, they felt that the societal changes from their own past meant that it was something their own children could not do without. The rise in the cost of living and the increasing competition for jobs prompted some

insecurity among the parents about their child's projected future. Natasha's mother told me:

> Natasha's mother: I just hope that she gets a good job at the end of it really, because in this society they need a good job at the end of it to be able to afford a mortgage. I don't know how any of them can afford the mortgage even if they go to university and get a good job; you've got to be earning really, really good money to even get a mortgage now
>
> (White British: School B, year 6, LA)

Although they didn't specify that their child needed a degree, a good education was a must. The exception to this was Samuel's mother who did not have a degree herself, but held aspirations for her son to follow this academic path 'I personally would like him to go to university...that has got to be the basic nowadays'. Rajesh's mother (Indian, low achiever) and Dima's mother (White British, high achiever) both spoke about aspirations which were in direct contrast to their own experiences when they left school:

> Rajesh's mother: Just basically so he can earn a lot of money and enjoy his life. Unlike my husband [who] say(s) 'you've got to be a doctor' and all that...I'm just saying, don't be a factory worker like me, to be honest, that's all I'm saying to him

The projection Rajesh's father has for his future (as a doctor) is one that is arguably related to belonging to the Indian community. One of the teacher

informants told the me that South Asian parents often held aspirations for professional jobs for their children, such as a lawyer or doctor. The following quote is from Dima's mother echoed the sentiments of Rajesh's mother:

> Dima's mother: I know it's a cliché thing 'I don't want you to end up like me' but I don't want to see any of my children, aged fifteen, sixteen working in a factory sewing. I was quite young when I had my children too, so I don't want that for them either, which I don't really say it's wrong, but I do say 'you need to go to school, go to sixth form college or whatever, and university and then maybe when you're thirty think about having children'...but I'm sure they're not going to want this misery, type thing
>
> (White British/Chinese: school A, year 2, HA)

Not all of the parents expressed these strong feelings about the future of their child, some said they wanted no more than for their children to be average. At the extreme end of all of these opinions were Dale's parents. His mother said to me:

> Dale's mother: He can come away from school with no qualifications as far as I'm concerned, as long as he is happy and he is able to do what he wants to do, whatever that may be. We will push him to get qualifications but I won't push him to the extent that it makes him terribly unhappy
>
> (White British: school A, year 6, LA)

Dale's parents may have been unwittingly sending mixed messages about the value of education and this could explain their son's indifference to learning. In

his interview, Dale told me 'I do like school but I don't like learning', an attitude to the world of education which might contribute to his lack of achievement so far. It was also reported in the first part of this chapter that Dale was one of the children who was reluctant to engage in both explicit and implicit forms of home numeracy. Unlike many of the parents discussed above, Dale's mother revealed some naivety in believing that no qualifications could realistically lead to a choice in his future about whatever he wanted to do. It is likely that Dale's choices would indeed be limited if he had no basic qualifications after leaving school.

The analysis reveals that parents are not just constrained by their past, but have the ability to change the present because of the ways in which they project a future for their child. However, it is important to note that a parents' projection of the child's future is not necessarily idealised, but constrained by issues in the present, such as low levels of achievement in school. In the case of Dale's parents, this had led to a devalued representation of education in the present. For other parents, it is the connection made between the representation of their own past to that of their own child that is important, generally leading the parents to conclude that all they want is for their child's life to be different from their own. In this sample, the parents who had reached high standards in education, such as a degree, hoped for the same from their children.

Crossing the generations: the parents of the parents

This part of the chapter reveals how the past involves more than just the overlap of one generation with another. The data in this research brings to light the means

by which the previous generation, the parents of the parents, plays a mediational role in the child's current learning. All of the parents mentioned the influence of their own parents in some capacity, although the influence of the parents had more resonance for some than for others, and they spoke significantly about them in their discourse. Out of twenty-two parents, twelve said they wanted things to be different for their own children than it was for them and their parents. Six expressed contentment at the way their parents had dealt with their education, and said they wanted to do the same for their children, three of the parents did not reveal any strong feelings about their own parents' involvement in their learning at all. For the twelve parents who wanted their own involvement in their child's education to be different from that of their parents, a transformation in the meaning constructed for education had occurred over time. However, for some of these parents the change in meaning did not necessarily match the requirements of current practice in school because of the changes that had occurred at an institutional level. The complexity of the situation increases even more, since some meaning constructs remained stable, while others had transformed, but even those constructs, which had changed were not necessarily reflected in changes in the way the parent actually engaged with mathematical activity. This section will look at the circumstances and events in the parents' lives that had created a change in meanings and practices over time. Those events are initially summarised in this table below:

Table. 23. Summary of parents' self-perceived experiences and their consequential intentions of change for those twelve parents

Parent	Self-perceived experiences in the academic past	Consequential intentions
Michael's mother	Death of her parents	Increased levels of emotional support from parent to child
Sumana's mother	Death of her parent, plus a parent with English as a Second Language	Increased levels of emotional and practical support from parent to child
Nimrat's mother	Lack of support because she is second generation immigrant	Increased emotional and practical support from parent to child
Rajesh's mother	Lack of support because she is second generation immigrant	Increased emotional support from parent to child
Elena's mother	Lack of interest in education from father	Increased emotional support from parent to child
Dima's mother	Lack of interest from parents	Showing parental interest in school and homework
Amy's mother	Lack of interest from parents	Showing parental interest in school and providing more encouragement
Lewis' mother	Lack of interest from father	Willingness to help and a greater understanding of educational option in the future
Natasha's mother	Lack of encouragement	Encouragement to do homework
James' mother	Too much pressure to succeed from father	Trying to find a balance between encouragement and success
Jamal's mother	Too much pressure to succeed from parents	Maintaining support
Simon's mother	Lack of patience in mathematics homework help	Passed mathematics homework on to her husband

With the exception of Michael's mother, all of the experiences in the past and the consequential intentions summarised in table 23 can be viewed through a cultural lens as historical products. The death of the father of Michael's mother is not a culturally representational act, but a one-off event. The other experiences and their consequences, on the other hand, are historical and cultural products.

Not surprisingly, the early loss of parents (for Michael's and Sumana's mother) had a significant negative effect on their education as children. Both of these parents lost their fathers at the age of eight years and the mother of Michael's mother had subsequently died when she was sixteen. Although the mother of Sumana's mother lived on, she could speak very little English, and as the oldest child in the family, Sumana's mother was left with little home support in terms of her academic learning:

> Sumana's mother: Unfortunately my father died when I was eight and **my mother really didn't know a lot of English** and we had to learn ourselves and me being the oldest, I didn't really have any guidance from my parents. A father who had died and a mother who didn't really know a lot
>
> Sarah: So you were paving the way for the rest of the children?
>
> Sumana's mother: Yeah, **whereas I feel my kids are so much luckier because they've got me and I've seen it, been there, and done that and they've got a bit of experience to go on** and with that I'm trying to help them for them to have perhaps, I mean personally speaking I think I could have done a lot of better than what I've done now really
>
> (Indian: school B, year 6, HA)

The above quote raises the issue of language and the problems that can arise for first generation immigrants when the home and school community do not share a common language. Her discourse indicates a separation of one community from the other, with language as the mediational reason for the disparity. The loss of

her father served to reinforce that gap, and Sumana's mother described how she was left to fill that role.

There were some other specific issues raised by some of the ethnic minority parents, which inspired changes in the way they dealt with their own child's education. Rajesh and Nimrat's mothers both had parents who were first generation immigrants and spoke about the difficulties this had raised for them with respect to their own academic learning. This next quote best illustrates the difficulties that can exist for the children of first generation immigrants, but more importantly, the efforts that these parents may make in order to try and ensure that things are different for their own children. Rajesh's mother said:

> Rajesh's mother: What I did right, when I was sixteen right, my parents bought a shop and because me mother was running it, I felt sorry for her, I didn't do any exams. I never had an education, which I regret now. Now I just work in a factory...And it wasn't my parents fault but because they were both from India, they weren't as enthusiastic on education as I am with Rajesh...**I'm more behind him than my parents was**. I know it sounds crude but I can't really remember my school years cos it was only me. But I think [with] Rajesh, mum's behind him, mummy's doing these books with me, or we do maths homework together.
>
> (Indian: school A; year 2, LA)

Highlighted here are this mother's perceived complications arising from having parents who are first generation immigrants. At the most basic level, she felt that

Rajesh needed the emotional support at home that she felt she herself had not received from her own parents. However, Rajesh's mother was one of the strongest examples of a parent who had changed some of her meaning constructs while others had remained associated with her past, thereby affecting the way she understood her home practices. Despite her strong emotional support at home her representation of achievement and child development (see chapter four) had limited the types of numeracy practices at home (see the first part of the present chapter). For instance, she told me that she was shocked to find that the teacher had expected her to teach Rajesh basic reading and writing skills before he went to school, a practice that she was unaware she was meant to do. It is this 'gap' in her representation and expectations of her child's school, coupled with her own lack of success at school, which might have contributed to Rajesh's low achievement.

Nimrat's mother described her experiences of learning at school to be much more positive as she told me:

> Nimrat's mother: I was always good at school, it always came quite easily to me
>
> Sarah: Were your parents influential in your education?
>
> Nimrat's mother: Not really, no. They're first generation immigrants, so they were just very grateful that we were going to school and they weren't having to pay for it... they didn't really bother
>
> (Indian: pilot school, year 6, HA)

Although Nimrat's mother didn't feel she had much educational input at home, she continued to achieve throughout school and was encouraged by her teachers. Coupled with this were her experiences working as a classroom assistant in school, which had also helped her contribute to her son's success at school.

Elena's mother (a first generation immigrant to Britain) described the lack of interest her father showed in her education as a child, which meant she felt she had not been given the support to fulfil her academic potential as a child. She was brought up in France, and like Nimrat's mother, had found herself enjoying and being successful at school. Coming from a large family where her siblings had demonstrated no interest in academia her father did not support her desire to continue post-compulsory schooling. He refused to sign papers stating that she could continue with her education beyond the age of sixteen, even though the state offered to pay for her education. This situation led her to give up school before she could take any exams and move abroad. One effect of this episode in her life was that it led her to believe in strong emotional support for her daughter's education.

Four other parents (Dima, Amy, Lewis and Natasha) described a perceived lack of interest in their education in general from their parents. These parents felt that their parents were not bothered about their education, but didn't elaborate further on why they held these representations. More importantly, showing interest in their children's schooling and providing encouragement was a consequence of their own past experiences.

While the above parents spoke about the lack of interest of their parents in their education, others felt they had sometimes been pushed too much. The consequences of the past experiences for these parents then, was finding the right balance with their own children. James' and Jamal's mothers spoke about the pressure they had felt from their parents and considered this to be a negative aspect of their past experiences which they did not want to repeat with their own children. James' mother explained:

> James' Mother: I mean my dad, he did quite well, he worked for IBM and was an engineer for some years, but in order to achieve it, he came from a background where he had to go to night school and he had to work very hard to get to where he got to, and he, you know, and I can see that as a parent now, he wanted it to be easier for me, he wanted it to be better for me, and I respect that and I love him for it. But what it did mean was like, "No, you haven't quite achieved what I want you to achieve" and that was a hard thing to live with. And I can remember one report card coming home and "You've only got a D in physics", and it's like "Oh no dad, look I got an A in maths, please"... **I have to remind myself of that and you know, as a parent I get it wrong sometimes, but I want to encourage my children and you know, do the best they can, in whatever that might be.**
>
> (White British: school A, year 2, HA)

One experience, which stands out as different from the rest, is that of Simon's mother, who described herself as a person who had struggled with maths. She would always pass the maths homework over to her husband and her own past experiences with her father might explain why she developed insecurities about mathematics.

> Simon's Mother: I remember my dad used to lose his patience with me and I couldn't understand and grip *[sic]* it, you know, he used to go through it with me. He'd do it for so long and then he'd lose it, you know and say 'why can't you learn?' and he'd say 'are you stupid?' So that didn't help either. I think my mum was a bit more understanding but she didn''t, she probably did the same as me, dad was always quite good at maths so she passed it over.
>
> (White British mother: school B, year 2, HA)

This led to a situation in their household where home learning was separated by subject, with her husband conducting mathematics learning and Simon's mother taking responsibility for the literacy-based activities. She also described how her behaviour towards her son's mathematics was deliberately different to that of her father's, when she said 'I try to make light of it rather than getting them anxious because I remember my dad used to lose patience with me'

The six parents who reported on the contentment they felt about the way their parents had dealt with their education used discourses like 'supportive' and 'involved'. These parents described how education had been part of their home

learning, books were available and in one case, numeracy games played a large role in family life. Resonating through the discourse of a number of these parents was the expressed importance that their parents were 'not pushy' but interested in their world of learning.

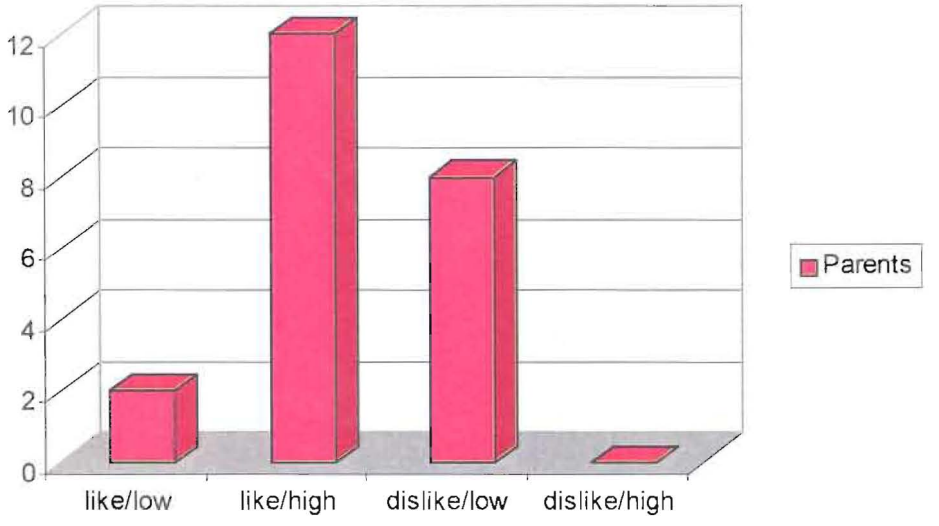
Addressing the historical aspects of parental involvement in learning shows that the situation has greater complexity than the mere overlapping of two generations. In reporting on descriptions of parents' own parental involvement, representations of learning have been a mediational factor across three generations of individuals. On a societal level, changes in migration and educational institutionalism have led to misunderstandings in the generational gap, such as the expectations of school on the home community.

Furthermore, parents are active participants in the reproduction or change of a particular representation or behaviour. The six parents described above who reported contentment with the way their parents had dealt with their education had explicitly chosen to reproduce many of the behaviours, like numeracy games. Other parents, such as Rajesh's mother had unintentionally or implicitly reproduced a home environment, which maintained a lack of numeracy practices. On the other hand, she had explicitly/intentionally changed her levels of emotional support for her son from that of her own parents, thereby indicating that representations can change while other practices remain stable. Parents then can use change as a basis for what they want to be rejected from their own past.

Parents' positive and negative experiences with maths

As parents spoke about their positive and negative experiences with mathematics at school, it became even more apparent that the past has a powerful influence on their meaningful representations of the present. Through this data, it is possible to see the extent to which the history of the parent and child overlap. During the interview, parents spontaneously rated their success in mathematics, as well as giving their opinion about whether they enjoyed it. Not surprisingly, most of the parents who liked mathematics rated their success as high, while those who did not, rated their success as low. The two exceptions to this rule, seen in the table below are Rajesh's mother and Michael's mother.

Table. 24. Frequency of parents' self-rated success in mathematics compared with their positive or negative feelings towards the subject



These figures reveal that mathematics tends to evoke a large polarity of feelings among the participants. What is of relevance to this study is the extent to which these representations of mathematics held by parents influenced the achievement in mathematics of their children. The following table reveals the same self-rated success and feelings towards mathematics when they are matched with their child's achievement levels provided by the class teacher.

Table. 25. Child's achievement coupled with parental representations of mathematics success and feelings towards the subject

Child's level of achievement as rated by the teacher	Parents' self descriptions		
	Parent likes maths/high success	Parent likes maths/low success	Parent dislikes maths/low success
High	8	1	**4**
Low	**4**	1	4
Totals	12	2	8

This table shows that there were no clear-cut relationships between parents' perceived success at school, their feelings about mathematics and their children's current achievement. The cases where there was consonance between parents' representations of themselves and the achievement of the child, can be taken as examples for the parental form of mediation that seems to have resulted in internalisation of their own representations by their child. This was apparent in the analysis of the cases where both the parents and the children liked or disliked mathematics and were in turn, matching high or low achievers.

The parents who disliked mathematics, rated their success as low and subsequently had a low achieving child, spoke in common about the difficulties they had trying to get their child to engage in home mathematics learning. As touched upon in the first part of the current chapter, mathematics homework for these parents and their children was a particular struggle, but also, these children took little pleasure in more implicit numeracy practices like board games. As revealed in the quote below, one child associated with her own mothers dislike of the subject:

> Natasha: [I don't like] maths, I'm just like my mum

This is an indication that parents' past representations about mathematics have the potential to mediate in the child's current identity as a mathematics learner.

The cases of dissonance were also informative. There were four parents in the sample who rated their own success in mathematics as low, but had children who were high achieving[9]. Three of those parents said that they had spouses who took on the role of mathematics tutor in the house. Simon's mother (White British: school B, year 2, HA), Nimrat's mother (Indian: pilot school, year 6, HA) and Jamal's mother (Bangladeshi: school A, year 2, HA) are all examples of parents who passed any mathematics related learning over to their husbands.

[9] In this sample it was only mothers who rated their success in mathematics as low

In contrast, Dima's mother (who happened to be a single parent) had found that her mathematics learning in college, as an adult, had helped to improve her own confidence with mathematics presently, and therefore felt more equipped to help her daughter.

In contrast to the consonance pattern, where internalisation seemed to have occurred, in the dissonant cases there was evidence of orchestration of practice directed at preventing the 'negative' past experience of the parent. As discussed at the beginning of this section of the chapter, the past experience is used to inform what the parent does not want to be reproduced. There is an attempt to create (or appropriate from other sources, other than one's personal experience) mediators that will change the experience of the child in a desired direction.

The same parental data can be viewed in light of the levels of parental involvement the teachers told me they thought parents engaged in at home.

Table. 26. Parental levels of involvement coupled with parental representations of mathematics success and feelings towards the subject

Levels of parental involvement	Like maths/high success	Like maths/low success	Dislike maths/low success
HPI	7	1	**4**
LPI	**3**	1	3
Middle[10]	2	0	1

[10] There were a few instances where teachers were unable to decide where to place children in terms of parental involvement, they asked if they could place the child in the middle.

The table revealed that three of the children whose success is high, and whose parental reports of their success are high, are categorised under low parental involvement. These cases should be addressed on an individual basis as to the reasons why these parents were classified as showing low parental involvement. The first is Louise's father (White British) who was described as having low parental involvement simply because of the difficult circumstances of the family. Louise was the youngest of five children, the oldest of whom was severely disabled. The teacher reported that homework did not always get returned or was poorly presented, but was sympathetic to her home circumstances and described her home life as 'chaotic'. James was another high achieving child whose mother rated herself as highly successful at mathematics, but whom the teacher had placed as having low parental involvement. In this instance the teacher felt that James' homework came back with too many mistakes for the parents to be adequately involved. This negativity was amplified by the fact that James' father was a mathematics teacher at secondary school level, thereby raising the expectations of the teacher. The teacher may also have assumed that she and James' father would share a representation of homework help because of their common job roles. Fazain's mother had been educated in Pakistan and had enjoyed high levels of mathematical success during her school years. She attributed some of Fazain's struggles at school to her own communication difficulties in English with her son at home. She also felt she had not been equipped to help him with his home education because of her lack of knowledge about the British school system.

There were four other dissonant cases revealed in table 26 which are worth addressing here. These four parents had rated their own success at mathematics as low, and had disliked the subject, but were classified by the teacher as high parental involvement. These cases are the same as those matched above with a child who is a high achiever, they are Simon's mother (White British: school B, year 2, HA), Nimrat's mother (Indian: pilot school, year 6, HA), Jamal's mother (Bangladeshi: school A, year 2, HA) and Dima's mother (White British: school a, year 2, HA). The first three parents may be have been classified as high parental involvement because help was obviously provided at home through the father. However, there was a tendency among the teachers to rate high achievers with high parental involvement anyway.

In the discussions about the parents of the parents, it was revealed that six of the parents expressed contentment with the way their parents had dealt with their education and aimed to reproduce this aspect of their past. Interestingly, those six parents who spoke about positive involvement from their own parents tended to rate themselves as having been more successful in mathematics. The following table (table 27) shows a breakdown of those six parents whose own parents had played a supportive role and their child's respective achievement levels (plus parental levels of involvement rated by the teacher):

Table. 27. The supportive parents and their child's levels of achievement and levels of parental involvement

Name of Child	Levels of Achievement	Levels of Parental Involvement
Monifa (Black African)	High	High Parental Involvement
Samuel (Mixed Race; Black African/White British)	High	High Parental Involvement
Anthony (White British)	High	High Parental Involvement
Louise (White British)	**High**	**Low Parental Involvement**
Jennifer (White British)	**High**	**Middle Parental Involvement**
Amira (Pakistani)	**Low**	**High Parental Involvement**

The three cases, which particularly stand out in the table above is Louise, Jennifer and Amira because of the inconsonance between the child's level of achievement and the teacher's rating of parental involvement. The circumstances of Louise and her father are discussed above. As Jennifer's class teacher, Richard (school B, year 2) asked if he could place her parents somewhere in the middle for levels of parental involvement, but not for reasons one might expect. Richard felt that Jennifer's mother underestimated her achievement and therefore did not seek to increase it enough at home:

> Richard: I think Jennifer achieves stuff but her mum doesn't expect her to achieve, so her mum is helping but you would never define her mum as stretching her

As discussed in the first half of this chapter on representations of mathematics, Jennifer's mother had a strong representation of learning through play, which was evident in her own descriptions of the way she was taught at home by her own parents. Aiming to reproduce a 'learning by play' environment could have contributed to Richard's opinions of Jennifer's mother.

The case of Amira stands out because, despite her low levels of achievement, her parents are classified as having high levels of parental involvement. Mary, as her mathematics teacher, does not necessarily articulate these high levels of parental involvement in positive terms:

> Mary: The trouble with Amira is that she went to Pakistan for virtually the whole of last term, so she missed out a huge amount. But her parents are quite, well pushy really, not with the school but they want her to do well. They wanted her to go to an independent school, senior school, so they applied to all schools. And she's so far below average...and they don't speak, English is their second language. I think they have high expectations and probably put the pressure on

Amira's parents were classified as high parental involvement because of their perceived high levels of expectations for Amira, and these have been reinforced in Mary's eyes by the parents' desire to have Amira in private education. In fact, Amira's parents were trying to prevent the negative educational experiences they had encountered with their eldest son, who they said had fallen in with a bad peer group and was failing with his studies. Amira's family saw private education as a

means of avoiding a similar scenario. Mary also raised Amira's long stay in Pakistan as a negative part of her discourse. While the prolonged visits of ethnic minority families to native countries can be a problem for schools, Amira's mother explained to me that the terrorist attacks of September the 11th meant their stay had been extended because they were not allowed back into the country. Finally, Mary used language as a justification for Amira's low achievement. Although the home language was predominantly Urdu, Amira's mother was educated in Britain and spoke fluent English. Mary's criticisms had allowed her to place a low achieving child under a high parental involvement category whilst still reinforcing Mary's negative appraisal of Amira's home background.

It was not possible to see, in this sample, a categorical link between self-perceived parental success in mathematics to the achievement of the child. Parents, who did not perceive their success in mathematics to be high, often put into place mechanisms for helping their child at home, such as passing mathematics learning over to a more confident member of the family. At times when these mechanisms were not in place, or identification with the low achieving parents is strongly established (Natasha is an example) difficulties surround the home mathematics learning at both explicit and implicit levels. In the case of Dima's mother, where perceived success at school is low but her daughter's achievement is high, the parent has been able to draw on adult experiences in mathematics to produce change.

The role of the teacher in the parents' education

All the parents, with the exception of Louise's father, spoke about the enduring influence the teacher could have on their academic learning while they were at school. Mathematics evoked powerful feelings from their past in relation to the teacher, in some cases being instrumental in the success or failure of that subject. The next quote from Dima's mother reveals how significant the relationship with the teacher can be:

> Dima's mother: I never really grasped maths, there was only one year out of all of my education where I did grasp maths and that was down to the teacher that we had at high school, and that would have been my third year. And he was a great teacher and I learned more in that year I think, than the rest of my whole time at high school, and then the following year we didn't have the same teacher
>
> (White British mother: school a, year 2, HA)

Adam's father (educated in Ethiopia) and Monifa's father (educated in Nigeria) expressed similar sentiments when talking about their mathematics teachers at school. Both spoke about very positive experiences with particular teachers who inspired their progress. They also mentioned that having a teacher who was very good at maths did not necessarily equal being a good maths teacher.

Significant episodes for other parents often centred around authoritarian, almost frightening experiences. These experiences could be so strong that they created a

catalyst for any subsequent feelings towards the learning of that subject. Simon's mother explains this moment:

> Simon's mother: Going back to maths, when I was in the year my daughter is in now, which is eight, the teacher we had then, I think that just blew it all with maths for me. She was just, if I think back now, I don't think she'd make it. She used to rap knuckles and shout and scream and I think, she wouldn't be here as a teacher now if it was today. So any confidence was just blown and I was terrified for having her for maths because I knew I couldn't cope with it
>
> (White British: school B, year 2, HA)

For her, this was also coupled with her negative experiences with her father and mathematics learning at home discussed earlier in the chapter. It is not surprising that mathematics homework was passed on to her husband in her own household. However, not all the parents let singular episodes affect their long-term learning of mathematics. Jennifer's mother described an equally negative relationship with one of her teachers, but this had not affected her learning later on. This success could be partly attributed to the supportive home environment that she described.

6.2.2. Social aspects of parents' past experiences

In previous parts of this chapter it has become evident that emotional aspects of practice were very important to many of these parents. When retelling their own past experiences, parents, despite the emphasis in the interview on mathematics learning, drew heavily on emotional representations that were social in nature.

Social experiences tended to evoke significant catalysts for change, promoting an externalisation of behaviour in the parents who were affected in negative ways. All the parents, for example, mentioned some form of bullying, either from teachers or from fellow pupils. Michael's mother (White British: school A, year 2, HA) and Louise's father (White British: school A, year 6, HA) both spoke about the strict and authoritarian teachers they had experienced in school. The ensuing change in the behaviour of Michael's mother meant that she had deliberately gone out of her way to praise Michael to the point where she said 'we have actually gone over the top'. In contrast, some of the parents felt that school now lacked the kind of authoritarian discipline of their own day, and saw this as a negative aspect of their child's current schooling.

The most significant number of past experiences with bullying were reported as coming from other children. The bullying that Rajesh's mother experienced existed because of what she perceived as the cultural dissonance between home and school. What might seem trivial to an adult, like having cheaper clothing and a different hairstyle, had a big impact on the way other children reacted to her socially. She was particularly aware that her parents had no conception of what the social side of her school life was like. When I asked her about her memories of school she remarked to me:

> Rajesh's Mother: Just being bullied and not having what everyone else had, I'm sorry, that's how I see school

As a result of these experiences, and knowing the detrimental affect it had on her school learning, Rajesh's mother took particular care to show interest in Rajesh's social relationships at school, she said to me:

> Rajesh's mother: Because I've been through that [bullying] I would know, like I say to him 'have you got lots of friends, are you ok at school, is anyone picking on you?' my parents wouldn't even ask that question
>
> (Indian: school A, year 2, LA)

This point raised by Rajesh's mother is echoed by Jamal's mother who told me that her mother's upbringing in Bangladesh had created a gulf between the social aspects of her own schooling and her mother's understanding of those issues. The quote below by Jamal's mother reveals that she felt this 'gap' was a cultural one, rather than a generational one:

> Sarah: Did it make a difference for you going to and from school that your mum was from Bangladesh, did it ever create issues for your?
>
> Jamal's Mother: In some, some stages were quite hard. Like understanding when things were going wrong at school or whatever and you talk to your parents, they wouldn't understand because they haven't been here. **Now when Jamal says something about school, I can relate to that** cos I've been through it myself, I was born here, so
>
> (Bangladeshi: school A, yr2, HA)

Jamal's mother felt she could draw on her own experiences within the British school system to help her son in ways she felt her own mother could not. The onus that parents put on first hand experience is very powerful, even though the ethos of school as an institution has changed considerably over the duration of the years between the education of the parents and those of the children. The following quote from James' mother shows how powerful the social impact of past experiences can be in parents' recollections of their school experiences:

> James' Mother: I was bullied quite a bit...so there were bits of my school days I can remember being very, very unhappy, very, very unhappy. Almost, one time, I remember back, almost suicidal.

Issues surrounding bullying have become increasingly prolific in recent years and this reveals a divide in the generational gap between the parents' education and their children's education. What was once considered a bad experience, but an expected part of educational life, has become a much more sensitive issue. This has brought a heightened awareness from some of the parents towards their own children's social experiences. As Dale's father told me, taking school problems like bullying to his mother was just not an option for him, as he was expected to deal with these occurrences himself.

While the parents quoted above had spoken about their negative academic aspects of school, some parents spoke about the positive social aspects of schooling like friendships. For three of the parents the emphasis on friendships had, they felt, led

them to stray from their academic studies, particularly in high school (11-16 years).

Having experiences like this induced many of the parents to be very sensitive to their children's happiness at school. In chapter four it was highlighted that many parents used their child's emotional state as an indication of their happiness at school. Quite often this resulted from a level of sensitivity about the problems that can arise at school realised because of past experiences, giving an indication of how powerful the transition of symbolic meaning through time can be.

6.2.3. Teacher's past experiences raised in relation to academic learning

Past experiences acted as a powerful mediator in the construction of meaning for some of the teachers in the sample, as well as the parents. This part of the chapter will draw on some of the teachers' descriptions of the past and the ways they have used these to inform their current teaching practice and representations of their role as a teacher. Different teachers in the sample tended to draw on specific aspects of their past. For example, Mary's discourse for past experiences centred on the teachers she had encountered. Richard's experiences focused on the support from his father. In view of this, certain teachers are discussed in greater depth when specific meaning constructs are evoked.

The role of the teacher in the teacher's past

Mary (school A, year 6, LA) described how, as a child, she had consistently felt the need to please the teacher and sought to do this through her academic work.

Praise and encouragement from the teacher worked as a strong foundation for her success at school. As she went through high school however, she had become increasingly discouraged by the teachers' lack of caring towards her work and began to allow this to affect her studies. Moreover, Mary felt that one of the teachers of her past had a direct influence on her ability to learn mathematics in school. The episodes from her past that she recalled to me were significant enough for her to single out:

> Mary: I really liked maths but I had two really awful experiences...I was at lower school and I had a really awful teacher. I couldn't understand multiplication, you know, 27x3, and she just went absolutely berserk at me and made me stand in the corner because she'd explained it three times and I still didn't get it. So that upset me quite a lot...so I didn't like maths for quite a long time because of her

Mary recovered from this episode and found herself liking maths again and being in the top set throughout her school years. Her success at mathematics in school was evident from the fact that she was put in for her final year examinations a year early. She went on to do A'level[11] mathematics, which she felt she couldn't cope with, and this led to a change in her identity as an achiever in mathematics when she said 'some people have a very mathematical brain and I didn't'.

[11] A'level examinations take place between the ages of 16 and 18 years

Despite her earlier success at school, these incidences had led to disintegration in the evaluation her own achievement in mathematics.

Like Mary, Chris (school B, year 6, LA) recalled a very specific circumstance from his childhood, which influenced his own belief in his achievement in mathematics. His episode also involved a significant teacher. When I asked Chris whether maths at school was positive or negative for him, and he answered:

> Chris: Very negative, I can remember the very date that I stopped being interested in mathematics. I don't mean the date specifically but the day that I stopped. It was my geometry teacher in high school and we were doing some lesson and I didn't understand something and the rule was that if you didn't understand when he was teaching it you would go up to his desk and ask him. I remember standing in a queue so there were several people who didn't understand and **perhaps in hindsight I could look back and understand why he did it**, but at the time it was devastating. I got up there and asked him how to do it and he said 'I can't believe it, if you can't figure that out I'm not going to tell you, you'll have to work it out on your own' and left me standing there and would not say another word to me. So obviously I had to go and I can remember thinking 'what do I do?'
>
> Sarah: That lost feeling?
>
> Chris: Exactly, because I couldn't teach myself and we didn't have a structure where you could go and ask the person sitting next to you, you each had your own desk at high school and you did not talk to other people, you do your own work and that is it. So going asking another student is breaking the rules so 'who am I supposed to go and talk to then?' There was another maths teacher next door

who I could talk to but I can't do that in class so I just remember thinking 'fine, I quit'.

There are two striking aspects about this recollection from Chris' past and the first is the clarity with which Chris is able to retell his 'story'. The experiences of both Mary and Chris are described in episodic ways. One or two incidences had set in motion a psychological change in the representation of mathematics, which they perceived was triggered by the teacher. The second important point to note about the above quote is the way that, as an adult, Chris has come to understand his teacher's actions. It may be that Chris is able to use hindsight as a strategy for understanding this episode in the past because of his own current experiences as a teacher.

In Mary's interview, the discourse surrounding the teachers in her past continued. More importantly, she went on to describe her dislike for 'dogmatic' and domineering teachers. Using this representation of some of her teachers from the past, she describes below a manifestation of a symbolic representation of the type of teacher she would like to be:

Mary: I don't want to be an authoritarian, everyone's got a different style, obviously it's important to some extent, especially with that class, it's quite a small group. I want them to feel happy and I want to be able to talk to them outside the classroom and while wandering around the playground

While Mary and Chris shared similar past experiences concerning a teacher, it had led to different outcomes in their teaching practices. Mary's attitude towards this kind of dogmatic teaching method was reflected in her classroom practices, which were somewhat disorganised and revealed problems with the management of the children. During the ethnographic observations of the numeracy hour it was noted that the children frequently moved around the classroom, sometimes during a lesson. When Mary gave commands or tried to capture the children's attention she was often ignored. At one point, one of the boys in the class was using a calculator, Mary told him not to cheat and that he had to show his working out, when she walked away he continued to use the calculator anyway. These, and other obvious displays of defiance in some of the children in her class indicated that her anti-authoritarianism might have negatively informed her teaching practice. To that end, she is reproducing the childhood characteristic of wanting to please the teacher by trying to please the students.

Chris, on the other hand, conducted his classroom practice with patience, but firm discipline. His desire to be a helpful and approachable teacher was reflected in one of the interviews with one of the children. The child told me that although Chris was not his normal mathematics teacher, it would be Chris that he would approach with a problem because he felt that Susan (school B, year 6, HA) would not give him the help.

Susan also referred to the authoritarianism of the teachers during her time at school. However, she was pragmatic in her outlook of the past. Instead of

describing powerful and personal episodes from her own experiences, she used a general historical outlook on the change in teaching ethos as a means of representing the type of teacher she wanted to be:

> Susan: I do tend to work very much on the level with the kids. I'm quite happy to have a laugh and a joke with them within reason, but the ground rules are there…I think some of the teachers at primary school I didn't feel that with, but I think that was just the ethos of teaching in those days and teachers were kind of up there and you were down here

Anna (school A, year 6, HA) had also had a negative experience with a teacher whose lack of discipline and teaching ability led to Anna to attribute this to her underachieving in mathematics at school, although it was not episodic in the way Mary's and Chris' had been:

> Anna: You have to learn from your experiences and I can remember good points from other teachers and I think 'yeah, I remember a teacher who did that and how I felt when it happened so that's something I'm going to pick up on'. And then there are others where you think, 'oh no, definitely not doing that'

What is important about Anna's account of the teacher from her past, is the way she used the experience to change her current teaching practice. The notion of externalisation and reproduction is very useful here because Anna had chosen

certain aspects of past experiences to change while at other times seeking to mimic or reproduce positive teaching practices from teachers in her past.

Overall, the teachers discussed in this part of the chapter have used past experiences with teachers from their own childhood as a means of constructing and informing their current teacher representation. The means by which they did this were quite different, however. Mary and Chris recount powerful episodes, which they have used to promote change in an explicit way, their own representation of the teacher they want to be. Mary's classroom practice is an example of a situation where this change can become problematic. While Anna's and Susan's discussions from the past are not characterised by a particular event, there was evidence in their discourse that certain characteristics associated with teachers from the past had induced change. One teacher, Richard, was an example of a teacher who expressed contentment with the teachers from his past. Perhaps because of this, Richard did not allude to the idea of change.

Teachers' descriptions of their own achievement in mathematics

The construct of achievement has been a pervasive element of the current programme of study. This continued to be the case for some of the teachers in this sample, when drawing on their own past experiences. Like the parents, the teachers self-rated their own success at mathematics at school. The ratings that they attributed to themselves as children did not necessarily reflect how they felt about their mathematics skills in adulthood. Increased feelings of success in adulthood were brought about, for some teachers, through teacher training, a

process which allowed many of the previously insecure mathematicians to see the subject in a new light. The following table reports on the teachers' self-rated success of mathematics during childhood and adulthood:

Table. 28. Teachers' self-rated levels of achievement in mathematics during childhood and adulthood

Name of Teacher	Levels of self-rated achievement in mathematics during childhood	Levels of self-rated achievement in mathematics as an adult
Catherine School A, year 2 Teacher of high achievers	**High Achievement**: Catherine was in the year above her natural year all the way through primary school. She was also in the top set for mathematics	Felt confident at mathematics as an adult
Jane School A, year 2 Teacher of low achievers	**Average**: Jane described herself as 'middle of the road group for maths' and expressed vague memories about her mathematics learning at school.	Jane felt considerably more confident as an adult owing to the positive experiences in mathematics during teacher training
Mary School A, year 6 Teacher of low achievers	**High Achievement**: Mary was in the top set for her mathematics and her experiences tell us she was achieving well, however, this is at odds with her own self-ratings which were less confident	As an adult Mary felt confident teaching mathematics but was less confident using it in everyday settings
Anna School A, year 6 Teacher of high achievers	**Average**: A bad experience with a poor teacher led to Anna not fulfilling her mathematical potential at school.	Anna felt very competent as an adult but did not elaborate why
Richard School B, year 2 Teacher of mixed ability	**High Achievement**: Richards's experiences with mathematics had been very positive throughout his school life.	Mathematics was the subject he felt most confident in teaching
Susan School B, year 6 Teacher of high achievers	**High Achievement**: Susan felt very comfortable with mathematics throughout school and took her final school mathematics exam a year early	Susan was confident in her use of mathematics as an adult
Chris School B, year 6 Teacher of low achievers	**Average**: Chris did not feel particularly competent at school with his mathematics.	Chris continued to feel that it was one of his weakest subjects as a teacher and in everyday settings left mathematical activities to his wife
Shazia Pilot school, year 6 Teacher of mixed ability	**Average:** Shazia did not feel particularly strong at mathematics at school and cited long division as a particular problem that stuck for her, even into adulthood.	Shazia felt fairly confident using and teaching mathematics

This table reveals that Chris and Mary expressed the most insecurity about using mathematics in adulthood, but in different ways. Mary felt competent teaching mathematics but was less comfortable using it in every day situations. Chris, on the other hand, felt that his feelings towards mathematics influenced his teaching, and commented on the fact that he felt it was one of his weakest subjects. Although he understood that he must have reached a certain level of competency to become a teacher, he worried that at some point his lack of confidence might reflect on his students. The next quote reveals that his aspirations as teacher might explain why he felt that way:

> Chris: You always want to be your best and be a wonderful dynamic teacher that can do everything, 'pupils will always remember me', that sort of thing; he's the best teacher I ever had
>
> (school B, year 6, LA)

Anna explained that she was not concerned about her ability to teach mathematics. However, she revealed that she had resources to draw upon if the mathematics in the classroom challenged her own knowledge. Anna's husband was a secondary mathematics teacher and she could discuss strategies at home with him.

The ethnographic observations of the numeracy hour did display how the teacher's confidence with mathematics as an adult, altered their teaching practice in the classroom. Catherine, Jane, Anna, Richard and Susan were happy to allow the children to explore openly different mathematical strategies. The classroom

discourse could be discursive in these numeracy hours and some of the highly achieving children were very creative in developing different means of calculation. Mary, Chris and Shazia's teaching practice was much more directive. While this could be attributed to their own confidence as teachers of mathematics, it could equally have related to the fact that their classrooms contained low achieving children. Chris in his interview mentioned that he found bombarding the low achievers with a variety of ways to calculate the same operation could easily confuse them.

Using past teaching experiences to inform their current practice

The teachers in the sample had more than their childhood experiences to draw upon in helping inform their current teaching practice. Some of the teachers had worked in the profession for many years, others had experiences in a variety of schools and two had worked in the same school since newly qualifying. This raised two questions, the first relating to the teachers' relationships with the parents and the second asking about the extent to which the teachers' past experiences in multicultural schools informed their representations of teaching in their current school. The following table (table 29) shows the teaching experiences of the participants:

Table. 29. A description of the past teaching experiences

Teacher	School	Teaching Experiences
Catherine	A	Qualified as a teacher in 1974, had been at the current school since that time
Jane	A	Jane had qualified as a teacher four years previous to this study and school A had been her first permanent post
Anna	A	Anna had worked in school A for twelve years and had spent some time in a North London school prior to her current post
Mary	A	Mary had experienced a number of different schools particularly in the independent sector before coming to school A
Richard	B	Richard tended to move schools every two or three years and therefore had a wide variety of experiences
Chris	B	Chris' experience was quite varied when taking into account his teaching both in the United States and in the UK, although school B had been his first permanent post since qualifying in Britain
Susan	B	Susan had been teaching for 23 years and qualified in 1979. She had worked at school B for 14 years. Prior to that she had experience in a small village school before having her children and returning to work at a later date.
Shazia	pilot	Shazia had been at the pilot school for a number of years, as she had started there as a classroom assistant before being promoted to class teacher

Mary and Richard were the only two teachers who drew significantly on their previous teaching experiences, so their interview data will dominate this part of the chapter. Mary and Richard used their past experiences to a greater extent than the other teachers because they had worked in the most varied number of posts prior to joining school A and B respectively. The comparisons between these teachers' previous posts and their current school practice were made meaningful through the relationships with the parents of the children they taught. However, Mary and Richard spoke about the parents in different ways.

At her current school Mary felt very isolated from the parents, not simply because she didn't have her own form, but because the parents in the junior part of school A were not allowed into the playground in the morning:

> Mary: In my other school we used to have a barrier duty where we'd stand at the gate, you know, we'd always be there talking to parents and you had that thing [communication] there

Mary clearly missed this communication with the parents and expressed that in her last school a particular day was set-aside for parents to visit the classroom, an experience that she had found particularly positive. Furthermore, in her previous post in the private education sector, Mary had felt that children were expected to work beyond their capabilities as a result of an elitist attitude towards private schooling. She was surprised to find in her current school that parents shared an equal desire for their child to succeed. Although, in an earlier part of her interview had said that she didn't think parents had the time to worry too much about their child's education, and were happy to give the responsibility of learning over to the school. It is important to bear in mind that Mary had not had any contact with the parents of the children she taught.

Mary's previous work experiences had included working with a number of other ethnic groups other than White British in the private school sector. Mary's general stance about working with children from ethnic minority groups is summed up in the next quote:

> Mary: I suppose that everywhere is multicultural, all schools are multicultural...I think, I don't see any difference. I haven't noticed any difference...I did find some cultures were more ambitious for their children, like the Indians. They were very concerned that their children were at the top or concerned that they were doing very well. The Chinese as well, really wanted them to do brilliantly. If their child got 98% they wanted them to get a 100% and they were 'well, what can we do for them to get 100% next time?'.

Mary seems to have a number of difficulties in trying to establish her thoughts about the differences in working in multicultural schools. At first she attempts to establish a very broad view of 'multicultural', which extends beyond looking solely at ethnicity. However, she then moves on to the 'no difference' mode of thought about multicultural schools before returning to a comparison between different ethnic groups. Notice also that Mary is keen to draw on the most positive aspects of the education of certain ethnic groups by picking out those groups which are thought to be most highly achieving (Gillborn & Mirza, 2000). This may be reflected in the fact that her past experiences were predominantly in the private education sector.

Having worked in a number of different schools which contained a variety ethnicities and social classes, Richard was able to draw on these experiences to understand how class mediated in the relationship with parents. In school B Richard felt the parental support was more visible than in previous schools he had worked in, which were situated in working class areas of the town. In working

class schools he only really saw parents if there was a big problem. However, this differentiation may have been more apparent in school B because they had a 'rolling start' in the morning, whereby parents could come and speak to the class teacher in the fifteen minutes before the start of school. On deeper reflection about past teaching experiences with different ethnic groups he said:

> Richard: I'm very conscious that I'm at a white school here, its very obvious

When asked to expand on the reasons he felt conscious of teaching in a white school he went on to say that he saw the children as individuals, and tried to cater for their individual needs, but could not add any more.

These two teachers had used their past teaching experiences to help make meaningful what they felt was an important part of the school community, such as an idealised relationship with parents. Mary was particularly contradictory in her representations of parents following her experiences in a variety of schools. On one level she feels the parents in school A did not have the ability to communicate effectively with the teachers in the school, but on another level felt they neither had the time or interest to do so. This second observation is reinforced by the fact that she had no direct contact with the parents. Richard used his past experiences to understand the relationships between the teacher and the parents in a different way. His representations were not encumbered by the lack of communication because school B had an 'open door' policy with parents. Instead, he sought to

understand the variety of parental relationships he had experienced through social class or ethnicity.

Chris (school B) spoke about how his past experiences during teacher training in a predominantly South Asian school had revealed to him some of the difficulties this can present:

> Chris: I worked with a year three class and um, I would say ninety-five per cent of the class was Muslim, and I had no background at all in Muslim culture. I didn't understand any of the religious practices, I didn't know holidays, the diet and I just felt like I would say or do something that would offend them. Just feeling uncomfortable that you're not doing something right or you're not trying hard enough, or that you're just missing the mark and you don't even understand what it is.

Chris was able to reflect on his past experiences in a predominantly South Asian school so intricately because one ethnicity dominated that school and therefore the cultural differences were more obvious.

6.3. Discussion

To summarise, this chapter began by looking at parents' representations of mathematical practice in the home community. The notions of explicit and implicit practices have been a useful, if knotty way of tapping into parents' understandings of what counts as home numeracy. These concepts become knotty because what would normally be considered an implicit numerical practice by

some parents, such as cooking, was used by other parents as an explicit practice. However, it is precisely this complexity that makes the concepts so interesting because it teases out, not only what parents say they do, but also how they represent the particular practice.

Through the data it was possible to see how changes in practice over time, such as the introduction of computers as a learning tool for numeracy had impacted on some parents and not others. Some parents were able to represent this tool as an explicit form of learning while others had not utilised the computer or had deliberately avoided the use of the computer. This presents an interesting question about the process through which some parents are able to represent a tool, which they did not experience in their own childhood, as explicitly useful for their children?

The second part of the chapter explored representations of past experiences using the notions of externalisation and internalisation to understand how the representation had been transformed from the past to the present, and indeed, from the past to the projected future. Parents and teachers could both intentionally and unintentionally use the past to inform their current representations and practices. Thus they used their past experiences to mediate internalisation (reproduction), at other times they used them to promote externalisation (change). More importantly, this reproduction and change could occur simultaneously on different dimensions. One vivid example is Rajesh's mother, who intentionally sought to change the emotional support she gave her son at home, to that of her own

experiences with her parents, but unintentionally repeated practices in the home which were not shared by the schools dominating representation of learning at home. In looking at these two different ways of representing practice something interesting has emerged. While representations of the past may change, practice, in the form of engagement in mathematical activity may remain stable, so that home mathematical learning is transformed less by time than one might expect. This may be because practice, in the form of engagement in mathematical activity relies more concretely on direct experience from the past. This raises questions concerning how parents who have not had a range of mathematical experiences at home in their past transform their engagement in practice with their own children.

The concepts of heterochronicity and prolepsis discussed in chapter two are powerful tools for examining the way parents' and teachers' past experiences mediate in the child's learning. Heterochronicity addressed the distinct and partially overlapping histories of not just two, but three generations of individuals; as well as the overlapping histories of society and individuals. Prolepsis explored the way the imagined future, which is framed by past experiences, mediated and constrained the world of the present. The meaning constructs highlighted in previous chapters were evidently connected and sometimes born out of, the experiences of the past. Also, in exploring the notion of heterochronicity, Beach (1999) referred to the changes in an activity that were very concrete, the change in mathematical practice across two different time periods. However, this research has extended that concept to include symbolic representations of the past, which extend beyond the concrete form of practice. Furthermore, as Beach suggests,

recollections from the past are not just visible at the level of the individual, but can be transformed and influenced by changes at a societal level as well. A palpable example of this within the present research is parents' transformations of a projected future in terms of qualifications and work. Parents reported on the changes in economy and cost of living, which caused them to reflect on the circumstances facing their child in the future, which in turn led to their opinion about their child's education.

What is perhaps most interesting about this study, is the way the future acts as a mediating force in the parents' construction of the present. Prolepsis has addressed a gap in the theoretical underpinning of this part of the study, which heterochronicity could not fulfil; that of the representation of a future act. This is a two-way situation in that the constraints of the present, such as the child's achievement in school, affect how parents perceive the future. Equally, the expectations of the parents on the child's future can influence the messages they send out to their child about their education now.

For some people, memories of the past make stronger transitions than others. Some parents and teachers could recall very little from their childhood, while for others, episodes in childhood were very palpable. Negative experiences often occurred, or were described, as a particular incident so powerful that it had affect on the individual at the time as well as subsequently making a representational transition to the present. To this end, a past experience could alter one's identity long after the incident has occurred and more importantly, transcend the

generations; like the teacher whose practice is informed by a schoolteacher who made learning special, or the parent who is repelled from a subject for life. Neither was it surprising that the parents and teachers recalled more readily the negative experiences over the positive ones. The experiences of Mary and Chris and their problems with their mathematics teachers revealed that the same experiences in the past could inform the present in different ways. It is this aspect of the transformation of the experiences, which allows for each individual's current practice to be unique.

There is a mismatch between parents' meaning systems and practices of the past to that of the changes in the education system in the present. This is a psychological phenomenon since parents and teachers elaborate experiences to inform the present, but the consequences are not the same for different individuals. Practices undertaken by parents and teachers cannot be standardised because of the many educational experiences of their pasts, coupled with the changes in education at an institutional level. This raises concerns about the usefulness of parents using their past experiences as an aid to understanding about their child's current school learning, particularly if there is a reliance on the reproduction of practices which do not match those of the school community.

Some ethnic minority parents (and White British parents) did not engage in explicit or implicit numeracy practices in their child's early years, while other ethnic minority parents of first or second-generation immigration did. What makes the difference? Firstly it is important to recognise that one ethnic group

cannot be characterised by one type of practice. Within this diverse sample there were equally diverse ways of representing the practice of mathematics learning. This chapter has shown that experiences are both unique and socio-cultural, and it is these possibilities, which provide some parents with a shared understanding of what counts as numeracy with the school community. In other words, when dealing with practice in a school setting, in order for one type of practice to become meaningful in the home community the demands of the school community must be understood. However, practice in the form of engagement in mathematical activity could arguably require more concrete experiences as a tool for helping current practice than changes in representation like emotion.

It is these issues that might help to explain why, when looking specifically at representations of practice, differences between the three schools did not emerge in this data. If the experience precedes the representation then parents would have formed an understanding of mathematics learning in the home before the child went to school; perhaps even before the child was born. However, there also needs to be flexibility for changes in representations to occur. Take for example Nimrat's mother, who said that her upbringing in a first-generation immigrant Indian household meant that her parents did not become involved in her home learning. However, as the mother of a high achieving child she was active in engaging in both explicit and implicit home learning with her own children. It was suggested that one possible reason for a change in her representation of home numeracy practices came about because of her adult experiences as a classroom assistant in a local school.

The next chapter will address some of these problems through methodological insights and present new questions brought about by discussions in the analytical chapters that could further research in the future. As the final chapter, there will also be an overall exploration of the data and a reformulation of the theoretical underpinnings presented in chapter two.

Chapter seven: Re-conceptualising mathematics learning in the multicultural home and school communities

7.1. Returning to the problem

In this chapter I return to the central problem of the thesis, that of how parents and teachers come to understand the educational world of the child, taking into account the complexities of the transition for the multicultural learner between two communities of practice. The problem presented in chapter one raised concerns about the gap in achievement of ethnic minority pupils, coupled with the increased expectations on parents of involvement in their children's learning following educational and political reform. Not previously addressed in studies of this kind is the impact on learning mathematics if the child is attending a school that has a number of different ethnic minority pupils. More specifically, what are the ways in which parents and teachers mediate the child's mathematics learning as they make the transition between home and school to either a multicultural or mainly white school?

Chapter two conceptualised how contextually the learner is viewed as operating as part of a community of practice. Belonging to such a community influences how the key figures construct meaning, and how this impacts on their formation of identity. Added to this was the individual's representation of practice in the form of engagement in mathematical activity and the partial or complete use by parents

and teachers of past experience as a mediator of the child's current learning. The different levels of the communities of practice framework of practice, community, meaning and identity were extended to include theoretical concepts borrowed from other researchers to enhance and extend those presented by Wenger himself. These researchers were also working within the Vygotskian tradition of sociocultural theory.

The analytical chapters reflected on the problem outlined in chapter one, namely, attempting to understand how the concepts of meaning, identity and practice are represented by ethnic minority children (and their families) who occupy multicultural and mainly white mathematics classrooms. With this in mind, this chapter will re-explore the theoretical positions expressed in chapter two in light of the data and seek to make elaborations on that. However, before returning to the theory, the first part of this chapter will present an overview of the analysis, followed by methodological implications to be discussed. After the theoretical discussions I will aim to integrate the theoretical position with the analysis before postulating on future directions for the current research programme.

7.2. An analytical synopsis of the programme of study

The analytical chapters revealed that representations of learning can have a powerful impact on how meaning is constructed and how this relates to the actual engagement in activity that is undertaken, and the informed identity adopted by the learner. The central question, which guided the investigation focused on how the representations of parents and teachers influenced the achievement of learners

in multicultural settings. This thesis sought to understand this by looking at i) how parents, teachers and children constructed a meaningful representation of the child's mathematics learning at home and school, (ii) how a number of participants from the sample constructed their identity in relation to home and school learning and (iii) the two different ways practice could be represented by the key figures in the study in the form of engagement in mathematical activity and representations of past experiences. It is important to reiterate at this point that 'practice' was viewed as an inclusive term, which encompassed more than the mere engagement in an activity, although this would clearly be part of the practice. Practice was also seen to include a way of representing belonging to a community, which extends the concept as a psychological phenomenon.

The interweaving of meaning and representations of practice

For analytical purposes the concepts borrowed from the communities of practice framework, namely meaning, identity and representations of practice, were separated. However, as discussed in chapter two, these concepts constitute parts of a whole framework. The next two sections in this chapter will bring together the concepts and demonstrate how they are inextricably connected. This first section will focus on the interweaving of meaning and representations of practice.

Chapter four described how the meaning constructs that were most likely to dominate in the home and school community were representations of achievement, homework and education. In chapter five it was noted that parents of successful children were more likely to make explicit links between the activities

they engage their children in at home (e.g. games) and school mathematics. When chapters four and five are brought together it can be suggested that parental involvement and the orchestration of their home practices is mediated by the parents' representations of their child's development and future, which in turn is influenced by their own past experiences.

Chapter four discussed in depth the meaning constructs which dominated the participants' discourse, and they were, achievement, homework and education. It was not surprising, given the emphasis on examinations and learner outputs in education that the ethos of the school community centred on achievement. Homework appeared to be one of the prevailing constructs of meaning for the key figures because it was the prevalent understanding of what counts as home numeracy learning for most parents and teachers. Furthermore, as an explicit form of engagement in mathematical activity this was a form of mathematics which was most likely to be representationally shared in both the home and school community. Representations of education were fundamental in helping to explore parental understandings of the foundations to their child's learning. Parents were forced to question why their children needed to attend school, and this pertained to their expectations of the school environment.

The analysis in chapter four used qualitative procedures for understanding how parents come to hold their meaning constructs by attempting to seek out their sources of information for holding that particular construct. Drawing on source information, like child development, allowed me to understand a little more about

the origins of the meaning construct. These sources gave me the opportunity to understand how parents viewed the educational world of the child with little first-hand experience of the school community. However, chapter four discussed the fallibility of using certain sources as a means of representing the child and its learning environment. Taking once again the concept of child development, Rajesh's mother (Indian; school A, year 2, LA) was a graphic example of a parent who did not share an understanding of this representation with the school community, by believing that his true education began when he was eleven or twelve years old and starting at secondary school. This representation of child development was interwoven with this mother's engagement in mathematical activity in the home community which was limited to pre-school based numeracy as discussed in chapter six. Many of the other parents with children of Rajesh's age group had begun to engage in much more advanced numeracy practices of both an explicit and implicit kind. She had failed to understand the demands of the school community to engage in implicit numeracy activities at home like board games, or the use of the computer as a mediational tool for mathematics learning. However, Rajesh's mother had utilised her past experiences from her own childhood to change her home practice with her son on another level. The enthusiasm with which she told me about her emotional changes towards her son, in terms of support, could not be ignored. This mother had deliberately transformed a part of her practice to improve the educational world of her child from that of her own past. However, since she was labelled as showing 'low parental involvement' by the teacher it seems that practice, in the form of

engagement in mathematical activity, was much more salient to the school community.

In contrast, it was possible to see how the home environment of some successful pupils portrayed the interconnected nature of meaning and representations of practice, which served to enhance the child's learning. Taking the example of Jennifer's mother (White British; school B, year 2, HA), the source of her construct of achievement in the form of representations of child development revealed a distinctly contrasting representation from that of Rajesh's mother. Jennifer's mother felt that parents should start doing educational activities with their children from the 'day they're born'. As a result of this construction of child development, implicit numeracy practices had been incorporated into the home community from very early in the child's life, thereby making them explicit. The following quote from Jennifer's mother exemplifies this point:

> Jennifer's mother: We taught her counting from when she was tiny. We used to count steps going up stairs and how many cups, like most parents, well I suppose it's not like most parents because a lot of kids don't. So she had a good grounding before she even went to school.
>
> (White British: school B, year 2, HA)

She also spoke about the way her own parents had developed a similar home environment when she was a child, an experience which she had internalised and deliberately reproduced for her own daughter. When she described the kinds of

implicit numeracy practices she engaged in at home with her child, she went on to say:

> Jennifer's mother: That's the way that I was brought up and it's just a natural way of teaching children and if you don't let them do things they're never going to learn

It must be stressed that Jennifer's mother is an example of a parent who made explicit her understanding of the value of using home numeracy practices, which in many other households in the study could be classified as implicit numeracy practices. As the quotes above illustrate, Jennifer's mother was conscious of the fact that taken-for-granted numeracy practices have the potential to improve mathematical skills.

However, this research has shown that levels of achievement are not necessarily consonant with parental reports on the use of implicit numeracy practices in the home. Monifa's father, for example, was unable to give me an example of an implicit numeracy practice that he had carried out with his daughter in her pre-school years. In his representation of child development, educational activities were proposed to start at six or seven years old. Monifa's father did tell me that the implicit numeracy activities Monifa engaged in after she started school were board games like Monopoly and mathematical games on the computer. It is not clear whether Monifa's father was unable to tell me about pre-school numerical activities because he did not engage in these kinds of activities, or because he did not share with me a representation of what counts as pre-school numeracy.

However, what did emerge about this family were the father's strong representations of past experiences from his upbringing in Nigeria which had led to high educational expectations for Monifa's current learning and her success in the future. This is also an appropriate moment to point out that just because this father could not give me examples of implicit pre-school activities does not mean that they didn't exist. As discussed in chapter six, implicit numeracy practices are such that they can go unnoticed as a numerical activity at all. This point is discussed in more depth in a later section of the chapter on methodological issues.

Another interesting finding pertaining to the construction of achievement and the use of child development as a source, was that the White British parents claimed to start educational activities earlier than the ethnic minority parents. The critical point here is not whether it was actually the case that ethnic minority parents began implicit activities later than their White British counterparts, but that their representation of doing so influenced how meaning was constructed surrounding child development. The meaning construct was often found to be influenced by past experience, whether this was through the reproduction of knowledge or the desire for change. In the case of Monifa's father, as explained in chapter six, he believed his own success in mathematics was due to his cultural upbringing in Nigeria. His construct about the value of success, and his faith in his own mathematical skills, as well as his daughter's might explain why she was a successful learner.

All of these cases have been used as examples of the interweaving of meaning and representations of practice when it is related to the construct of achievement. It is worth noting in this final chapter the diversity with which the parents, teachers and children viewed the construction of homework in this research sample. Homework served as an avenue of communication, as a means of understanding achievement, child development, the child and the school environment. Arguably, the schools in the present study underestimated the variable amounts of sources that homework supported from a parental perspective.

The interweaving of the construct of homework and the parental descriptions of practice were particularly evident in the interviews with parents of low achieving children. Dale's parents (White British; school A, year 6, LA) and Amy's mother (White British; school B, year 2, LA) were just two examples of parents who found it a struggle to get their child to engage in homework, and whose efforts to engage their child in implicit home practices like board games was problematic. The parents of high achieving children (whose independence with homework practice was prevalent) described how numerical games were undertaken in the home as a pleasurable activity. Anthony's parents (White British; school B, year 6, HA), who engaged in numerical activities like games on a frequent basis, both described similar past experiences with their own parents. As a result, a process of internalisation described in chapter six had led them to reproduce this experience with their own children. One thing all the participants had in common, when reflecting on homework as a construct, was that it was not used for increasing levels of achievement in a subject.

Equally, teachers who had little day-to-day contact with parents tended to use homework to try and understand the home community. As such, homework was a type of mediation between the home and school community. The teachers in this sample had fairly varied interpretations of the purpose of homework, descriptions of appropriate home help and the amount of homework teachers thought children should receive. This variability tended to revolve around discussions about the degree of independence that the child should have during the homework situation and the extent to which parents should help. It was proposed in chapter four that teachers' opinions about parental involvement in homework varied so much that parents stood little chance in interpreting every teachers requirements. In chapter six, for example, the White British teachers were keen for parents to engage in 'practical like' activities with children like cooking and using money. However, when Shazia was talking about her own Pakistani community in chapter five she felt that these kinds of activities were not recognised as explicitly mathematical. This point is raised in greater detail in the next section of the current chapter.

When it came to discussions about the amount of homework that children should receive, a number of the teachers recognised that out-of-school activities could impinge on this. The White British teachers spoke about recreational activities like swimming and dancing. However, only Shazia (the only ethnic minority teacher interviewed in this study) recognised the limited home time for some ethnic minority pupils because of religious commitments such as going to Mosque.

In conclusion, the two aspects of meaning and the representations of practice cannot be understood as independent. The connected features of these levels of experience contribute to the uniqueness of the individual, while at the same time allowing for the social context of the community to be recognised as part of the process. It is important to remember that the interweaving of meaning and representations of practice is not an additive process, in that there are no simplistic connections between achievement and parental reports on the engagement of particular numeracy activities for example. Rather, using these levels of analysis allows the researcher to avoid dichotomous relationships by adjusting the lens of focus (Rogoff, 1995) to include the whole social context of the learner.

The evocation of identity in the multicultural communities of home and school; fitting in meaning and representations of practice

This section will re-explore some aspects of the data on the construction of social identity as it becomes interwoven with the construction of meaning and representations of practice. The theoretical chapter described identity as a process of 'learning by becoming' within the context of a community of practice. More than this, the theoretical position presented in chapter two explored the broader social relationships of identity. The analysis of participants' representation of identity in chapter five and of the participants' representations of past experiences in chapter six, gave some indication of the way representations held in the home and school communities in the form of meaning and practice can make the formation of identity process very complex for the multicultural learner.

A case study approach was adopted in the chapter on identity as the interview with Monifa was used to illustrate how the two communities of home and school informed upon her sense of identity through her experience of participation in mathematical activity. Three different levels of identity were analysed, 'identifying the other', 'being identified' and self-identification'. Three groups of people played a key role in forming an impression on her sense of identity: her parents, teacher and friends at school. Monifa described how these key figures contributed to her identity as a learner in two respects, achievement and culture.

Monifa had learnt to identify the role of others in bringing about a reflection of her own identity as an achiever. She had revealed through her discourse how she had been identified by other key figures and had chosen to resist, reject or accept certain aspects of being identified in her self-identity. For example, it was the home community and not the school community, as one might expect, which contributed most significantly to her positive self-identification as a high achiever. Monifa was able to marry her construction of the home community as mathematically competent with her father's upbringing in Nigeria. As previously mentioned, chapter six revealed that Monifa's father also attributed his own identity as a high achiever in mathematics to his schooling in Nigeria and the value of success placed upon school pupils.

Monifa's case study also revealed something that previous psychological research of this kind had not really addressed. Conflict, in the form of different roles and representations towards mathematics learning within the same community can

occur. Monifa's mother and father held distinctly different projections about their daughter's future, while at the same time encouraging her to engage in activities in the present which would contribute most positively to that end. Monifa described to me how her mother encouraged her to be a singer, while her father hoped she would enter into a career in I.T. Her father's chosen role was afforded the greater status within the home community because he cemented the use of the computer in everyday practice. The points raised here can be related to Abreu's (2002) concept of social valorisation, whereby Monifa had chosen the home as the most powerful community because her representations of home achievement held greater status. Also within the home community, Monifa drew upon her father's projection for her future in I.T. because it had greater academic status and he was able to sustain her achievement in current practice on the computer.

On another level, conflict within the home community occurred between Monifa's mother and father in their advice to her about bullying in school. Significantly, Monifa described how her father's means of dealing with bullying at school was culturally informed by his own school experiences and was not compatible with the current modes of practice she had been taught at school. This case study points towards the complexities of the transition between home and school for the multicultural learner. Monifa did not choose to align herself with home community over the other in all aspects of her educational life so the construction of her identity is also a complex process.

The case study on identity and the teacher, analysed through the interview with Shazia, revealed the increasing complexity of identity formation as it develops into adulthood. The concepts of 'identifying the other', 'being identified' and 'self-identification' were not so easily separated as they were for Monifa. Within the same sections of narrative, an interchangeable use of the concepts were visible as Shazia both aligned with and then disassociated herself from the Pakistani community and/or the teaching community. It is this complexity that was evident in Dien's (2000) paper on identity, whereby her alignment with more than two ethnic groups was not viewed as a collection of identities. Instead, she used her experiences with her Chinese, Japanese and American identity in an integrated way. Shazia, while having a clear identity as a Pakistani woman in some respects, also recognised the rooted nature of her English identity. Dien's argument concerning the flexibility of identity as it occurs through socio-historical development, allows one to view the individuality of identity formation. Shazia's interview revealed how this integrated identity informed her engagement in mathematical practice in her own home community. Shazia had adopted what she described as British forms of mathematical learning at home which were implicit in nature, such as cooking. She had borrowed the use of implicit forms of numeracy learning from her own past experiences of growing up among British families and formed an understanding of that practice as something positive. However, it must also be remembered that what is described above is Shazia's representation of her experience of being part of both the Pakistani and British communities.

Continuing to use Dien's (2000) paper as an interesting comparison of perspectives it is possible to see that Shazia, unlike Dien, was much more inclined to resist or reject aspects of her Pakistani identity bestowed upon her by her family. During Dien's childhood, she totally accepted the 'socialisation' of her parents, teachers and society at large. She unquestioningly accepted the dramatic identity changes of the key figures in her life as Taiwanese society shifted from Japanese ascendancy back to Chinese governance. Dien does describe how the ease of this shift has developmental implications, since many of the older children found it harder to make the transformation. In the present study, Shazia's rejection or resistance to some aspects of her Pakistani identity indicated that her experience of growing up in British society could at times create conflict. Her father's unwillingness to allow her to go to the cinema because it was 'taboo' is one example. Shazia went on to reject this cultural value within her ethnic community and allowed her children to engage in this activity. On the other hand, her maintenance of religious festivals, traditional clothes and long hair provide some indication of the stability in her self-identity. As reported in chapter five, this suggests a hybridity in identity formation evident in the concept of coupling presented in the theoretical chapter. This will be discussed in more depth in section 7.5 of the present chapter.

The notion of mediation might be useful here in helping to understand the role of culture in Shazia's identity formation. While White British teachers might identify differences in learning in the home community through class or experience, Shazia determinedly used culture as a mediational tool for understanding the

parents of the children she taught. Shazia viewed the lack of involvement in the children's education by the parents to be part of the values and traditions associated with the Pakistani community. In 'identifying the other', Shazia suggested that the Pakistani community viewed learning as the sole responsibility of the school and therefore did not share with the school community a representation of what counts as home learning. In chapter five she also described how Pakistani parents did not engage in implicit numeracy practices like cooking because of the problems of doing these kind of activities in traditionally large families. At times, Shazia's descriptions of the home community were highly generalised. She was able to homogenise the Pakistani community by using her own experience of belonging to that community as a frame of reference.

The ways in which meaning constructs played a mediational role in the construction of identity was evident in the parent interviews also. The fact that parents from a number of different ethnic minority groups were interviewed meant that within the three levels of analysis of identity, informative themes emerged such as language, gender and the value of success. Within the scope of these themes, parents often related issues of identity to culture.

The importance of language as a powerful mediator of cultural identity has been reported elsewhere (Abreu & Cline, 2003) and was evident in two of the parental interviews in my study. What was most interesting about these two case studies was the different emphasis on language that the mothers reported which related to their identity as either first or second-generation immigrants to the UK. For

Fazain's mother the issue surrounding language was predominantly one of self-identification. As a first-generation Pakistani immigrant she reported that her difficulties with English as a second language created a barrier in helping her son learn at home, and this had become bound up with her own identity as a second language learner. To overcome this problem she attempted to combine English with Urdu in the home community. In terms of language, the interplay between the levels of identity formation for Rajesh's mother were much more complex. As a second-generation Indian immigrant, Rajesh's mother aimed to use Gujurati to help maintain part of his Indian cultural identity. She reached this decision by drawing on her own experiences of growing up with a dual British/Indian identity and the fact that she felt 'stuck in the middle' between the two communities. In terms of the analysis, this led to all three aspects of identity formation being interwoven within the same example of narrative. Uniquely, her narrative provided evidence of the hybridity of identity formation when representations are borrowed from making the transition between two communities of practice thereby creating a coupling of them both.

It was reported in chapter five that the 'value of success' was also a theme to emerge from the parent interview which related to identity. Earlier in this chapter it was described how Monifa had internalised her father's high 'value of success', which he claimed arose from his upbringing in Nigeria. It is worth noting here, in light of Monifa's internalisation of her father's representation, the influential part the parent can play in developing issues like the 'value of success' on identity. Monifa's father was not the only ethnic minority parent to explain how the 'value

of success' had played a big impact on his identity as a learner. Chapter six also revealed that Samuel's mother was influenced by the messages her own parents had conveyed to her about the importance of achievement. This representation of the 'value of success' is a reflection of her upbringing as a Black Caribbean woman in British society as she told me 'I'll be honest with you, I'm dealing with a colour issue here too'. Incidentally, both Monifa and Samuel were classified by the teacher as high achieving children.

These examples drawn from previous chapters highlight the increasing complexity of identity formation as the individual develops into adulthood. At the stage of Monifa's development, the levels of identification used in this analysis (identifying the other, being identified and self-identification) are still displayed in fairly clear-cut ways. Shazia's interview indicated that as we progress towards adulthood the identity construction of the individual becomes an integrated mix of the levels of identification in ways which are hard to separate. In the present research programme there has been a focus on the construction of identity from an ethnic minority perspective because issues surrounding ethnicity were proposed at the beginning of the thesis as part of the problem. Shazia's analysis has been useful in providing insights into the possible changes that Monifa will undergo, as she grows older and makes decisions about her cultural identity as a mathematics learner. The mediational role of meaning constructs on the formation of identity expressed through the parental interviews adds a level of understanding of the analysis of how meaning (on issues like gender and language) and representations

of practice (such as a parental job in computing used to support mathematics learning at home) inform each other.

7.3. The differences between school A, school B and the pilot school; multicultural versus mainly white

The structural systems of the schools was widely reported by the parents in the study as influencing their representations of the school community. The general criticisms of the way the school handled the home-school relationship and the running of the school appeared to have an overall influence on the representations of the parents concerning their child's learning. As reported in chapter three, parents tended to use the interview as a forum for discussing many aspects of their child's school learning despite explicit emphasis on mathematics learning. The following table reveals the number of parents who had negative comments to make about the school their child attended.

Table. 30. The number of negative comments made by parents according to the school their children attended

Number of negative comments	Pilot School (mainly South Asian)	School A (multicultural)	School B (mainly white)
	1	17	4

It is possible to see that the number of negative comments made by parents were distinctly higher in school A. The majority of the negative comments from parents of pupils in school A centred around the lack of information, particularly in relation to the SATs examinations. The following quotes are from White British

parents and exemplify many parents' feelings about the lack of communication with the school:

> Michael's mother: Um, I don't think there is enough information, I think you are kept in the dark. All these tests, you know, there wasn't even a reminder home to say this is SATs week... the word secretive keeps coming into my mind really, we'd have to ask if you want to know something you'd really have to ask and to push
>
> (White British: school A, year 2, HA)

> Dale's mother: We were left very much out in the cold. Because we never had a timetable or anything to help us to plan his revision with him... I was very disappointed over the lack of communication over the SATs and the lack of information that came out. Matthew's not the best child at bringing letters home, having said that, so I wouldn't say I blame the school entirely. But it would have been nice to maybe have had a quick meeting with the parents, a quick, you know called everybody in for an hour, it would have been nice, even half an hour, just to call everybody in and say 'right, this is what the SATs are, this is what we're expecting, this is the time table
>
> (White British: school A, year 6, LA)

This is in contrast to school B, where two provisions had been put into place to help enhance the communication with parents. Firstly, as highlighted in the analysis, school B had a 'rolling start', which meant parents had fifteen minutes before school where the class teacher made themselves readily available for

discussions. Secondly, school B held a parents evening which centred on the SATs examinations. Rather than creating anxiety among the parents (as many schools think this will do) the evening served to alleviate parents' concerns because they were not left to use other sources (such as the child itself) to gather information. As discussed in chapter four, using sources of information like the child can sometimes result in the misrepresentation of information. School A, on the other hand relied on tools of communication like letters and leaflets to communicate with parents. This kind of communication is problematic in that the communication is unidirectional and limits opportunities for response. It could be argued that this is the school community's means of maintaining the higher status in the home-school relationship.

The lack of communication between the parents and the teachers in school A (juniors) had further consequences. These teachers, particularly Mary, used the children as a means of trying to piece together information about the home community to a greater extent than the teachers who actually had direct contact with parents. Mary's access to parents was limited further by the fact that she was not the children's regular class teacher. Her role within the school was to take small classes of pupils who were at the lowest levels of achievement. The consequence of her not having her own class meant that even at parent-teacher consultations she did not have any face-to-face interaction with parents. Despite this, Mary still spoke at length about some of the children's home backgrounds using either information from the child, or representations of the child's home community provided by other teachers.

It is possible to see from table 30 that the number of negative comments from the parents in the pilot school was relatively low compared to that of school A. This was seemingly related to Shazia's availability to the parents. Shazia told me in her interview that she stood out in the playground and the children arrived and left for school and would approach the parent about an issue if she felt it was necessary. Furthermore, Shazia spoke the community language which was most represented within the school, thereby increasing accessibility to the school. One other interesting point about Shazia is that she lived within the same community as the parents and children who attended the school. She saw the parents and children near her home and at extracurricular activities like swimming, which gave her extra opportunities to engage with parents outside of school hours.

Perhaps the most striking finding from this research in schools, which are either multicultural or mainly white, is the invisibility of culture in the multicultural and mainly white schools. The mainly white school (school B) justified their lack of understanding of ethnic minority education in two ways. Firstly, very few ethnic minority children were in the school, which meant that the teachers felt uncomfortable drawing attention to 'difference' as it related to ethnicity. This may be due to the fact that the teaching body of the mainly white school were predominantly white teachers. However, the general lack of discussion about ethnicity even in school B is a concern considering the location of the school in a highly multiethnic town. Secondly, all the ethnic minority children and their families in the school were considered competent with English, which again reduced the need to make ethnicity 'visible'. The very multicultural nature of

school A meant that no one aspect of a particular ethnic group was highlighted. In a school that is dominated by one particular ethnic minority group, the representations and traditions of that group are more salient. For example, in the pilot school where South Asian students dominated, Shazia's descriptions of the pupils related predominantly to the Pakistani community. If the population had been more ethnically mixed, Shazia would not have been able to 'identify the other' in such categorical terms.

Furthermore, in chapter four an interesting finding to emerge from the data was that a much higher number of children in school B rated mathematics as their worst or least favourite subject compared to the other schools in the sample. There was a tentative suggestion in the analysis of this finding that the cultural ethos of the school might have contributed to this difference. In her interview Susan (school B, year 6, HA) said that in a previous teaching post at a predominantly South Asian school pupils were encouraged to be competitive with each other in their learning. In the interview with Monifa's father in chapter six he suggested that his own 'value about success' related specifically to his upbringing in Nigeria. In school B, a mainly white school it may be that the children did not share representations of success in mathematics learning that would be seen in the multicultural school, which in turn led to a negative ethos surrounding the subject. This is by no means a clear-cut explanation however, because the children in school B were not separated for their numeracy lessons into achievement sets until year 6. This separation according to achievement in their final year of school could have led to more negative thoughts about the subject.

7.4. Methodological implications

This piece of research has focused on the experiences and representations described by the social actors in the two communities of home and school and this had implications for the methodology used in the present research. By using this focus I have addressed what the participants told me they did as part of their practice, without witnessing first hand the practice as it took place. Methodologically, the interview approach may have provided only partial information when seeking out the kind of data sought in this research. Furthermore, in only being able to report what parents say they do, the quality of the mathematical engagement, or even the quantity of times that parents engage in home mathematics is questionable. When a parent describes that they do cooking with their child it is neither clear how much they utilise this activity or whether it is used functionally to help with mathematics. However, interviewing the child of the parents helped to compose a picture of the home mathematics situation. Baker (2001) revealed that researchers on his project often spent a considerable time in parents' homes joining in family life. This could include watching television with the families and joining in evening meals. However, this kind of ethnographic approach raises practical and ethical concerns, particularly when taking into account British values about privacy in the home. Parents in the present research were often under time constraints (such as having a full-time job) and held other responsibilities (such as having younger children and babies). Added to this are concerns over intrusion of space and privacy must be considered. To undertake such an approach would also have required a substantial

length of time and a smaller sample of parents, which would have raised other methodological implications.

The use of the interview technique as a methodological tool for tapping into mathematical practice must be scrutinised further. The process of interviewing and the data provided by the parents revealed, among other things, that the use of numeracy at home could be both explicit and implicit. The interview process reflects some of the complexities of shared representations of what counts as mathematics between the parent and the researcher. It may be that when a parent recounts a particular numeracy practice, which is explicit, they are simply sharing an understanding with me of what counts as mathematics. It also could be that implicit numeracy practices simply exist in the process of interpretation by the researcher. This matter has profound implications in multicultural research whereby interpretations of practice have cultural resonance. On a positive note, the interview technique used in this research, the episodic interview, allowed me to tap into mathematical practices which may have gone unnoticed with other interview techniques because of the emphasis on eliciting the concrete experiences of participants. Overall, the episodic technique provided a rich source of data relating to real experiences and the unique analytical means of looking at the sources with which parents constructed meaning.

The study of the multicultural classroom has been useful in helping to understand how the teachers in the sample came to understand the multiethnic and mainly white classrooms. As discussed above, the teachers whose experiences chiefly

resided in mainly white schools had greater difficulty in recognising possible cultural differences relating to ethnicity such as religion, food, clothing and values. Even then, it seemed to be the case that differences were only visible if the school was largely attended by one ethnic group (e.g. Chris' experience of working at largely South Asian school). However, I chose to look at a multicultural school because this reflected the reality for many of the pupils in British schools today. Furthermore, this thesis has taken community as the main unit of analysis, which means concentrating on the whole social context of learner. Much previous research has tended to focus on a particular group, often resulting in the 'deficiency model' of understanding multicultural education as described in chapter one. However, there is a valued place for the study of a particular ethnic group, particularly if care is taken to address between and within differences.

7.5. Theoretical framework revisited

In this section of the chapter I am going to discuss the theoretical framework as it related to the analysis of the data. I aim to expand on the limitations of Wenger's communities of practice model and discuss the necessity to combine communities of practice with concepts borrowed from other proponents of sociocultural theory.

The focus of the present study was on the experiences and representations of mathematics learning held by key figures within two communities of practice. Chapter three expounded on the necessity to explore the whole social context of the learner, and thereto, avoid reducing the research focus to only the individual

or the environment. Wenger's communities of practice was complementary to this end, in that it aimed to look at the learner from different levels of understanding in the form of meaning, identity and practice. However, while recognising that learners participate in multiple communities of practice, research in culture and cognition has often failed to address the psychological processes required to participate in more than one community of practice. Perhaps more importantly, there is less research of this kind that has focused on the mechanisms, which the actors in communities put into place to cope with the transitions between multiple communities of both themselves and their members. The lack of understanding about the psychological possibly stems from Wenger's overemphasis on the social because of the perspective from which he approaches the phenomenon of the learner. It is for this reason that the convergence of the theoretical concepts borrowed from a sociocultural tradition has been necessary. The amalgam of Wenger's communities of practice with sociocultural theory provides three key theoretical facets; (i) multiple levels of understanding in the form of meaning, practice and identity; (ii) the scope to explore the social and cultural worlds of the learner and (iii) to represent the historical in light of current practice.

It was in my view necessary to extend a theoretical understanding of meaning, identity and practice used within the communities of practice framework. The construct of meaning brought about the most extensive theoretical elaborations, from that of Wenger's own descriptions in 'communities of practice'. Wenger rightly highlighted that meaning is negotiated within the context of a community and drew upon concepts like reification, which are

particularly useful in studying adult working practice. My research drew instead upon the notion of 'sources of information' which helped to explain the source of a meaning construct. However, one issue largely neglected in previous research in the area was the issue surrounding the construction of meaning within the communities of practice framework: how was meaning negotiated between *two* communities of practice? As discussed above, this was particularly necessary in light of the transition process for the learner and the social actors around them, and the way meaning is constructed in the change between contexts. Viewing meaning in this way allowed for the lens of focus (Rogoff, 1995) to be adjusted from the level of the individual, to the level of the classroom and, further, to the level of the institution. Examining these processes in the light of Beach's (1999) concept of coupling drew attention to the transitory nature of activity and encompassed changes in spatial movement and time. It provided a means of understanding the negotiation of meaning when more than one community of practice is taken into account and the increased the potential for hybrid meanings to be borrowed from different communities. However, in the present study it was also recognised that coupling encapsulates more than the combining of mathematical strategies or tool-based activities, as Beach would describe. I suggested in chapter four and five that the representations of certain meaning constructs, like achievement and notions of identity, have the potential to be re-developed in the transition between the home and school communities.

My research recognised the importance of identity and the influential role it has to play on the mathematics learner. Once again, it was necessary to extend Wenger's

(1998) initial construct of 'learning by becoming' a member of a community of practice. While Wenger's construct adequately explains the changeable nature of identity, it does so within a limited contextual framework. In focusing predominantly at the micro level of analysis, two important points are neglected: (i) the construction of a cultural identity at the level of society and (ii) the influence of history on identity formation. Dien's (2000) comprehensive discussions of her own identity offered an avenue for expansion by placing the individual within the context of the history of society. As reported in earlier parts of this chapter, this was particularly important for some of the ethnic minority parents and their children (as well as Shazia) because belonging to a different generation of immigrant (i.e. first, second or third) was found to be an important influence on the individual's cultural representations. However, Abreu and Cline's (2003) three levels of analysis explaining the process of identity formation at both the individual and community level turned out to be the equally useful. The three levels of 'identifying the other', 'being identified' and 'self-identification' provided a way of understanding the process by which meaningful representations are established and internalised to become part of one's identity (Duveen, 2001). The combination of Dien's (2000) socio-historical perspective and Abreu and Cline's (2003) individual/community level of analysis provides a theoretical means of understanding identity as a rich and complex phenomenon. Wenger's (1998) model allowed both of these positions to be framed within the context of the learner's communities of practice.

The notion of practice, while inclusive of the way the world is experienced, needed elaboration at the level of engagement in actual mathematical activity. The notion of explicit and implicit numeracy practices was very useful in developing an analysis that incorporated those activities which parents undertook with a deliberate purpose of improving numeracy learning and those activities that parents engaged in which were not recognised as improving mathematics. Added to this were those parents who undertook very little implicit engagement on home numeracy, relying instead on formal and explicit forms of learning like homework given to them by the school community. Furthermore, the notion of explicit and implicit practices developed by Street, Baker and Tomlin (2001) was complementary to the communities of practice framework in that the social and cultural nature of the practice was inclusive. Therefore, in both instances, the practice could be viewed as a social phenomenon.

The present study has sought to correct the neglect of the historical, whereby meaning is negotiated through the developing histories of individuals and societies. While proponents of the Vygotskian tradition have given some attention to the importance of history (for example Cole, 1996) it has not been prevalent in studies on culture and cognition. Beach's (1995a, 1999) notion of heterochronicity offered a means by which the data in my research could take into account the complex histories of the key figures at an individual level, while adjusting the lens of focus to include societal and institutional changes also. It was particularly important in the current educational climate to be able to do so, since the experiences of the children from those of the parents/teachers in this study were

quite different, owing to the onset of the National Curriculum and the National Numeracy Strategy in the UK. My study captured a particular moment in cultural-historical time. However, the discussion on past experiences in chapter six revealed that using past experiences as a mediational tool for understanding a child's current school learning required the consideration of not just two generations (e.g. the children and their parents) but three generations of learners.

The concept of heterochronicity had its limitations in that it could help to understand the influence of the past on the present, but did not address how projected futures influence the present. Therefore, chapter two introduced the concept of prolepsis to understand this added dimension. The concept of prolepsis, namely the representation of an imagined future act was evident in the data from parents. Chapter six revealed that parents frequently used reflections from their own pasts to inform a projection of the future for their child. What was most remarkable when analysing the data in this research was the way in which parental projections for the child's future were not necessarily idealised. In fact, the constraints of the present, such as a low achieving child, could restrain parents from producing high expectations for their child's future.

In conclusion, Wenger (1998) looks upon using the school context in relation to his framework with some scepticism. His first point of criticism is a valid one; learning and teaching are not the same thing. Teaching does not necessarily conclude with learning, and what a teacher intended to be learnt is not always what the learner learns. Therefore, in the context of school learning the

negotiation of identity becomes the principal focus because understanding only what is learnt in school increases the possibility that 'school learning is just for learning school'. Justifiably, the culture and cognition movement has distanced itself from the purely operational aspects of school learning (see Lave, 1988). Some might argue that in doing so, the mathematics in the mathematics research has been lost. Wenger's inclusion of practice combats losing sight of the formal aspects of learning by allowing for the engagement in actual activity to form part of the analysis.

Wenger's focus on one community has been cited throughout this chapter as problematic when reviewed in light of the data in this study. His framework places the home community within the learning context at the 'periphery'. However, on a representational level, the home has the potential to play a much more powerful role, as demonstrated by Monifa's case study described in chapter five. Her interview revealed the potential saliency of ethnicity and culture in the transition between the home and school communities for ethnic minority pupils. It is possible to see how the modified understanding of coupling, initially presented by Beach (1999) offers a more satisfactory way of looking at the hybridism of representations that are possible in the transition scenario. The next section of this chapter will look at the way the theoretical concepts described in this research can be integrated in light of the analysis of the data.

7.6. Integrating the theoretical models with the data

Before moving on to re-establish a model which integrates the theoretical positions described in this thesis with the data reported here, there needs to be some justification of the use of 'representation' as it has appeared throughout this piece of work. It was not my intention upon using the word 'representation' to invoke a specific affiliation with a particular theoretical stance, but the theory of social representations does immediately spring to mind. The need to define the concept of representation, and the similarities between the conceptual ideas explored in this thesis and that of social representations warrant exploration.

The founder of the social representations movement, Moscovici (2000) described social representations as a way of communicating and understanding the reality of our daily lives. Moscovici (2000) thus wrote:

> Social representations should be seen as a specific way of understanding, and communicating, what we know already. They occupy in effect a curious position, somewhere between concepts, which have as their goal abstracting meaning from the world and introducing order into it, and precepts, which reproduce the world in a meaningful way (pp.31).

One of the major posits of the social representations theory is that 'representations' seek to make what is unfamiliar into the familiar. The key issue at stake here is the obvious and acknowledged similarities between aspects of sociocultural theory and those used in social representations research (Duveen,

2000). This comparison has allowed me to understand how the notion of 'representation' fits in with the theoretical concepts used in the current study.

There are a number of positive points of comparison, the most striking of which is the emphasis on bringing together the social and psychological to understand human phenomena. It has been mentioned in the previous part of this chapter that Wenger's (1998) communities of practice somewhat neglects the psychological aspect of the phenomena. But like Wenger's (1998) communities of practice and Vygotsky's (1978) sociocultural theory, social representations theory views individuals through their existence in society (social representations tends to use the word 'collective' where I have used society). Social representations theory has attempted to understand the way knowledge has a shared reality on a symbolic level and at the level of practice. This is crucial to my study because the emphasis goes beyond looking purely at the act of engagement in mathematical activity. The participants in this study conveyed the ways in which they perceived the world of their learning child.

Social representations draws also on the notion of meaning, particularly as it is used to understand systems of culture when new meanings threaten familiarity. The notion of representation as I have used it, like the definition used in social representations research, is seen not only as a dynamic and changing process inclusive of more than just the cognitive organisation of knowledge, but also as a process of symbolic realisation.

Moscovici (2000) recognised the importance of the historical in Vygotsky's writing and was unhappy with the subsequent neglect of this aspect of his work. Unlike some of the theorists who have drawn on sociocultural theory, Moscovici recognised the importance of not just the past and present, but the future as well:

> Just like any institution, knowledge and beliefs are in existence before, during and after the lives of single individuals. This is why all these forms of representations are stable, constraining and constitutive of society. That is to say, they have a reality which, however symbolic and mental, is just as real, if not more real, than a physical reality (pp. 211).

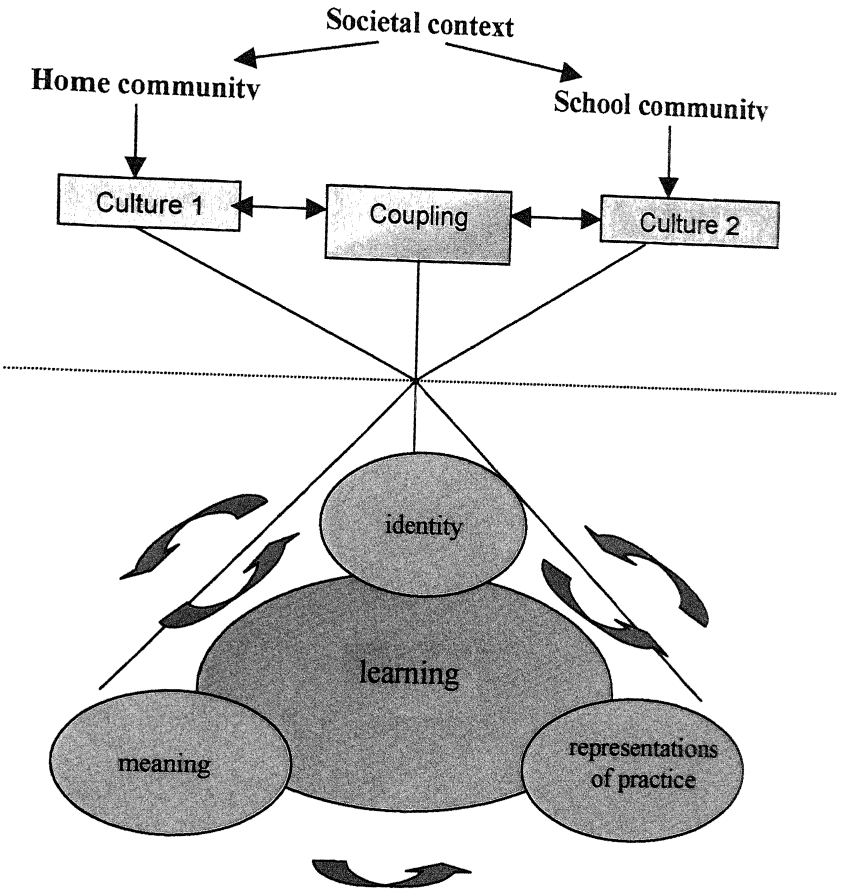
Particularly evident in the data in this thesis is the constraining influence the notion of future can have on an individual's present world. It is possible to see the conceptual similarities with Cole's (1996) discussions on prolepsis whereby the imagined future, which is framed by past experiences, mediates and constrains the world of the present.

Lloyd and Duveen (1992) and Abreu (1993) expanded upon representations and how they relate to the construction of social identity. Lloyd and Duveen focused on representations of gender identity while Abreu concentrated on the process of valorisation of knowledge among and between particular communities. Both of these researchers brought forth these theoretical concepts into the developmental domain as an on-going process. Evident in the discussion in this thesis are the increasingly complex ways in which identities continue to change into adulthood. Abreu's (1993) concerns about the ability of social representations and social

identity theory to reconcile social valorisation in more than one community is ongoing. Social valorisation (Abreu, 2002) plays a significant role in influencing how the transition process is experienced for the multicultural learner. First and foremost, social valorisation presents a conceptual means of understanding the ways in which the social and psychological come together. For example, in Abreu's work with sugar-cane farmers in Brazil, the low status of home mathematics negatively interfered with the children's success at school because of the conflict that arose from holding contradictory beliefs about an experience.

Returning to the theoretical stance reported in this thesis and the way it informs a new theoretical position in light of the data, an attempt has been made in the figure below to capture the interwoven nature of meaning, identity and representations of practice as it is informed by past experiences, while at the same time recognising the presence of more than one community of practice. The societal context overriding the home and school community is necessary to allow for the analytical lens of focus to be adjusted to include those changes that have occurred beyond the individual.

Fig. 7. A conceptual model depicting the complexities of the transition between two communities of practice for the learner.



Beginning at the macro level of the figure, the societal context feeds into the community level, which in the case of the present study is the home and school community. It should be noted here that the children in this study could have belonged to a number of other communities, which might have also influenced their learning. After-school activities and church going activities are just two examples. The figure then feeds down into the conceptual elements of the model. The transitions between multiple communities and the process of coupling of representations between two cultural contexts is denoted next. This is not a

hierarchical depiction of the process, but rather a contextual understanding of a complex situation. Coupling occurs simultaneously with the interweaving of meaning, identity and practice.

The figure above is particularly germane to the circumstances of the ethnic minority learner who makes the transition between home and school. Take for example Monifa, whose hybrid representations of home and school meant that on some levels a hybrid coupling of identity formation had occurred. For example, in the section of chapter five on self-identity she told me she attempted to borrow mathematical knowledge from both communities. In the end it appeared that when the mathematical strategies of home and school became incompatible her solution was to separate the two, leading her to describe herself as two different people in the different settings. On another level, one representation that was shared between home and school was her positive identity as a successful learner. She was able to make this representation meaningful by using high exam results at school and her family's identity as achievers at home to cement the construction. The model has brought together important theoretical concepts with the data to create a unified whole.

7.7. Future research

I suggest five directions for future research into the experiences and representations of mathematics learning in the communities of home and school as a multicultural society. The first is to extend our understanding of the conflict that can occur within one community of practice, particularly those which are taken for granted as unified. Despite the fact that the practices that parents engage

in (like numeracy) are often the domain of one particular parent this issue has not yet been properly addressed in research that explores the influence of the home background on children's school learning. Previous research in the area of psychology has tended to assume that parents share their expectations and common projection for the success of their child in the future. More research needs to be carried out to understand how disparate future projections for the child influence current practice in the education world of the child. Similarly, the unified or discordant opinions of the head teacher, classroom teacher and teaching assistants could have a bearing within a classroom community.

This research raised problems with interviewing parents in a retrospective fashion about the numeracy practices they said they engaged in with their children at home. Many parents found it hard to recall exactly what practices they had engaged in and at what point in the child's development, despite the fact that the youngest members of the sample in this research were from year 2, and therefore only six and seven years old. It is suggested that interviewing parents with children of pre-school age would produce a greater possibility of understanding the lived experience of the moment. Sampling more age groups would also create an added developmental dimension so that it would be possible to show how home numeracy learning changes as the child gets older.

Bagga-Gupta (2003) looked at the spatial aspects of the school context for bilingual deaf children in Sweden. She found that physical spatial, as well as cultural and linguistic boundaries imposed upon the deaf students were in

evidence. The present study touched upon spatial layout of the classrooms and the way they were organised by all the schools according to achievement. In addition, in many of the schools in the study (except pilot and yr 2 school B) the children moved to a different location for their numeracy hour which was dependent on their level of achievement. However, this aspect of the classroom was not fully addressed in this thesis and would contribute positively to understanding the achievement of pupils in multicultural and mainly white classrooms, as well as the construction of the learner's identity.

It was tentatively suggested earlier in the present chapter that the teachers who had experienced working with pupils from different ethnic backgrounds had gained a greater insight into the effect multi-ethnicity had on the classroom ethos. Future research extending the teacher interviews to include more white and ethnic minority teachers in a variety of schools would add further insight.

Finally, the study of children's learning can be extended beyond looking just at the two communities of practice of home and school. The impact of out-of-school activities on the child's learning, such as private tuition, Brownies and Scouts, dance and sports have yet to be understood. Heath (2002) suggested that children who maintain out-of-school activities tend to have higher levels of achievement in school but this has yet to be studied within a culture and cognition framework. Future research would benefit from looking at the mathematical content of these activities as communities of practice in their own right, as well as positive influences on the outcome of academic achievement.

To conclude, all of these directions for research involve the extension of the study of ethnic minority learning within and between multiple communities of practice. This study has provided data which suggests that the way parents and teachers choose to focus their mediational representations of mathematics learning can influence the child. If the home and/or school community promotes a positive representation of success in mathematics then the child is likely to carry that meaningful representation in the transition between these two places. More importantly in the case of the ethnic minority pupil, this representation may be attributed a cultural status within the home. This has implications in the educational arena with respect to the teacher's understanding of the transitional process that ethnic minority children undergo and the levels of visibility that culture and ethnicity are given in the school community.

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Appendix

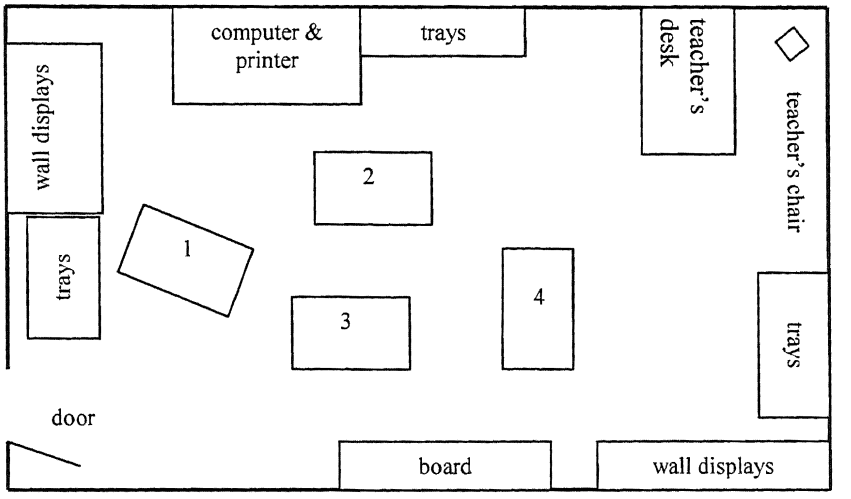
8.1. Content of the numeracy hour and layout by classroom

Pilot classroom
Teacher: Shazia
Year: 6
Achievement group: Mixed

Week	General Topic	Oral/mental step	Main activity	Plenary
Wk 1	Data Handling	Using language associated with data handling	Drawing and calculating charts and graphs	No separate plenary
Wk 1	Data Handling	Discussing frequencies	Using the frequency data to draw a line graph	Children talk about using block graphs to add totals
Wk 2	Calculator Skills	Teacher shows basic calculator functions – then asks children to mentally predict answer to a sum	Worksheet with problems to solve using a calculator	Study of positive and negative numbers
Wk 2	Shape and Space	Children have to guess the shape by asking the teacher questions	Quadrilaterals & their properties – children cut strips of card to make different quadrilateral shapes	The children describe as a class the properties of other shapes shown on the board
Wk 3	Shape and Space	Children draw on scrap paper the shape the teacher is describing	Children make rhombus and parallelogram shapes	Teacher hands out a sheet of paper with different shapes on
Wk 3	Measures	The children calculate different lengths using the counting stick	Converting metres into kilometres and visa versa	Teacher goes over the conversions which a number of children have

				had difficulties with
Wk 4	Shape and Space	Using the counting stick to count from negative to positive numbers	Plotting shapes onto a four quadrant grid and making translations	Teacher shows how the grid should have been done
Wk 4	Shape and Space	Adding pairs of numbers that make five – including decimals	Plotting shapes onto a four quadrant grid and making translations	Teacher asks for the co-ordinates of the translated shape
Wk 5	Number sequences	Multiples of 5 and 10	Worksheet with missing number sequences to fill in	Homework is handed out and discussed
Wk 5	Number sequences	Multiples of 3 and 6	Worksheet with missing number sequences to fill in	No separate plenary
Wk 6	Negative numbers and number orders	Using the counting stick to count from negative to positive numbers	Using a thermometer to work about negative and positive numbers	Teacher looks at answers to the lessons questions
Wk 6	Negative numbers and number orders	No mental oral – children have returned late from assembly	Plotting positive and negative numbers in the form of temperatures on to a grid	Teacher discusses last weeks homework
Wk 7	Calculations – multiplication and division	Teacher explains how to multiply decimal numbers	Worksheet with multiplication and division of 10, 100, and a 1000	The teacher asks the bottom three tables to look at the board while she explains the main teaching activity in more depth
Wk 7	Calculations – multiplication and division of decimals	Teacher shows the class how to work out the nine times table using their fingers	Multiplication and division of decimal numbers by 10, 100, and a 1000	

Diagram of the classroom layout of the classroom observed in the pilot study

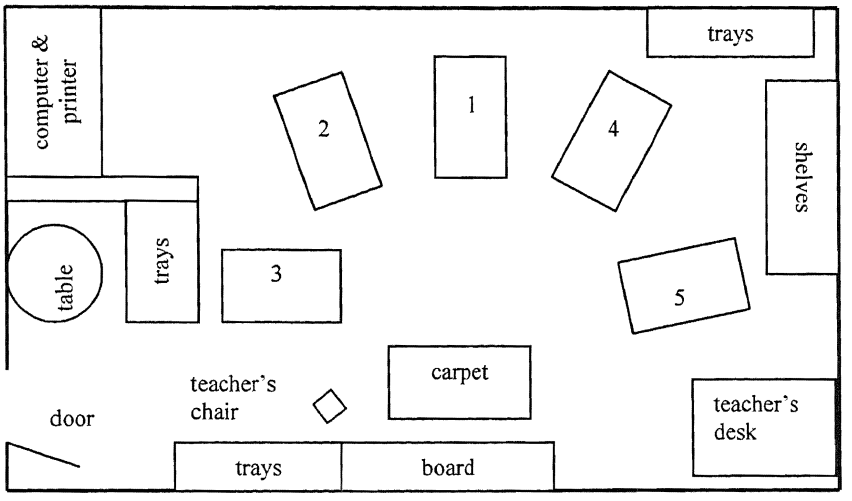


1 = highest achieving children to 4 = lowest achieving children

School A
Teacher: Jane
Year: 2
Achievement group: Low

Week	General Topic	Oral/mental step	Main activity	Plenary
Wk 1	Problems involving 'real life' - money	Number bonds to 3, coin recognition	Using combinations of coins to make a pound	No separate plenary
Wk 2	Shape and Space	Number doubles under 10	Creating bigger shapes out of smaller shapes, counting sides and corners	No separate plenary
Wk 3	Measure	Number bonds and doubles under 10	Measuring height and length of each other	Children discuss as a class their tallest and shortest measurements
Wk 4	Calculations	Reading numbers in words	Placing numbers on a number line	No separate plenary
Wk 5	Calculations	Number bonds to 10	Adding three numbers together with the help of the 100 square board	No separate plenary
Wk 6	Calculations	More than and less than 10.	Counting on and back in 10	No separate plenary
Wk 7	Time	Doubling and halving numbers under 20	Translating from digital to analogue clock and visa versa	No separate plenary

Diagram of the classroom layout observed in school A, year 2, low achievers



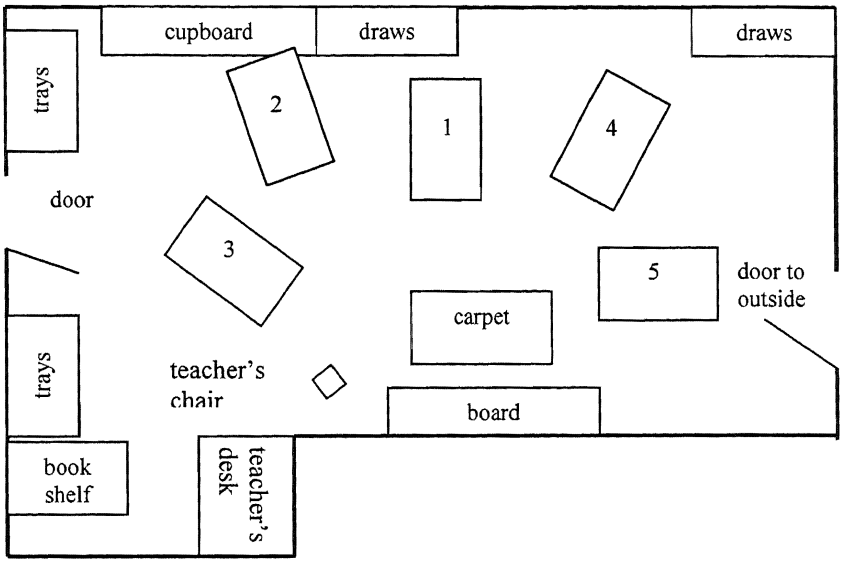
1 = highest achieving children to 5 = lowest achieving children

School A
Teacher: Carole
Year: 2
Achievement group: High

Week	General Topic	Oral/mental step	Main activity	Plenary
Wk 1	Shape and Space	Number bonds to 20	Symmetry and grid work	Children sing rhymes to help them learn north, south, east and west
Wk 2	Measures	Doubling and halving numbers between 0 and 200	Children given different items to measure around the classroom	No separate plenary
Wk 3	Measures	Counting forwards and backwards in 10s, starting from any number e.g. 107	Worksheet involving dates on a calendar	No separate plenary
Wk 4	Calculations	Multiples of 2, 5, and 10	Subtraction – using adding on to subtract	No separate plenary
Wk 5	Calculations	Counting in 10s and 100s from any given number, writing out three digit numbers	Adding – adding on 10 to two and three digit numbers	Teacher asks how many digits are in the numbers she calls out
Wk 6	Fractions	Class discuss ½ ¼ and 1/3	Children have to colour and write fractions of shapes	Teacher goes over more examples of fractions

Wk 7	Calculations	Addition, subtraction, division and multiplication of two digit numbers	Addition and subtraction with the same question	Revising the calculations that many of the children had found hard

Diagram of the classroom layout observed in school A, year 2, high achievers.

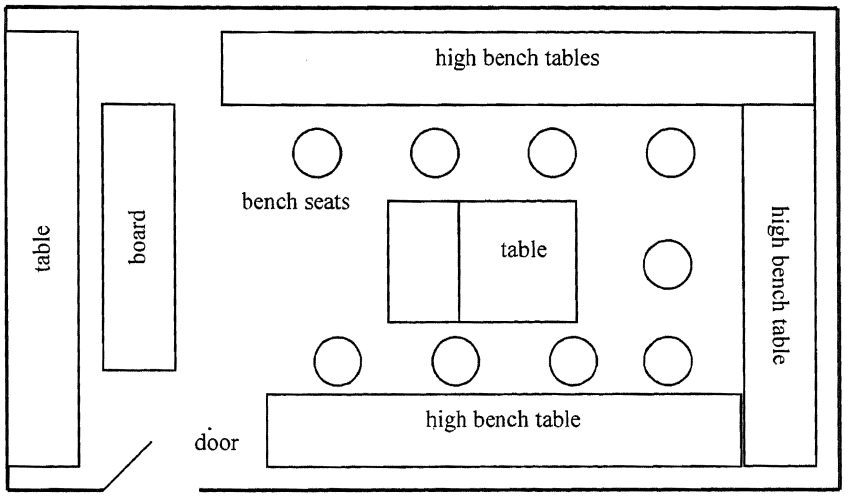


1 = highest achieving children to 5 = lowest achieving children

School A
Teacher: Mary
Year: 6
Achievement group: Low

Week	General Topic	Oral/mental step	Main activity	Plenary
Wk 1	Calculation	Six times table	Division of two and three digit numbers	Teacher discusses rewards for that lesson
Wk 2	Shape and Space	Three times table	Plotting co-ordinates on a basic grid	Teacher uses a dice game to plot co-ordinates on a grid on the board
Wk 3	Calculation	Multiplication of two digit numbers	Worksheets with multiplication and division of two and three digit numbers	Teacher hands out homework
Wk 4	Calculation	Children discuss long multiplication	Multiplication of two digit numbers	Teacher shows how to use Xxx for large multiplications
Wk 5	Calculation	Class discuss answers to test questions conducted previously	Addition, subtraction and multiplication of three digit numbers	Class play a mathematics game involving multiplication
Wk 6	Problems involving 'real life' calculations	None	Class discuss percentages as a whole	No separate plenary

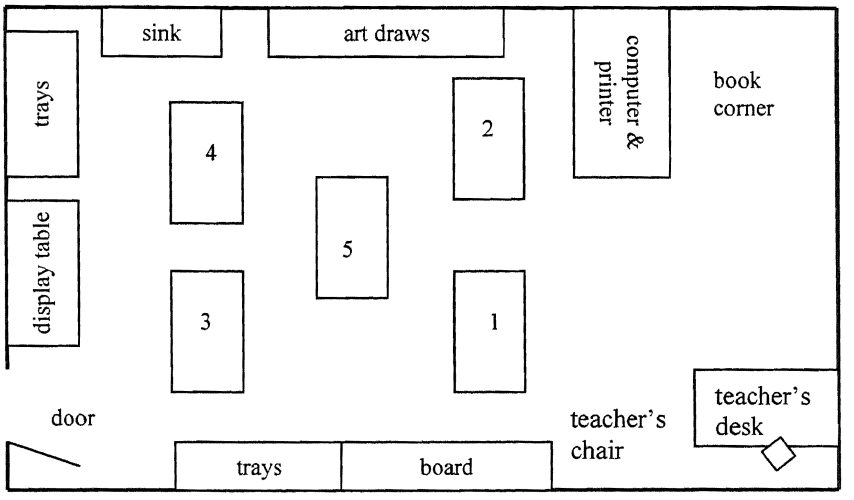
Diagram of the classroom layout observed in school A, year 6, low achievers.



School A
Teacher: Anna
Year: 6
Achievement group: High

Week	General Topic	Oral/mental step	Main activity	Plenary
Wk 1	Shape and Space	Using a counting stick to count from negative to positive number	Plotting a shapes on a four quadrant grid	Teacher goes over the plots on the grid
Wk 2	Problem solving & measures	The class discuss what steps to take to solve the problem	Children are required to calculate mileage allowance Children discuss measurement while measuring their hands	No plenary
Wk 3	Calculation	Children discuss place value	Addition and subtraction of decimals	No separate plenary
Wk 4	Calculation	None	Mental arithmetic test-class check and discuss their answers	No separate plenary
Wk 5	Calculation	None	Number sequences using decimals	No separate plenary
Wk 6	Shape and Space	Nine times table	Manoeuvring shapes to different degrees, plotting co-ordinates	No separate plenary

Diagram of the classroom layout observed in school A, year 6, high achievers.



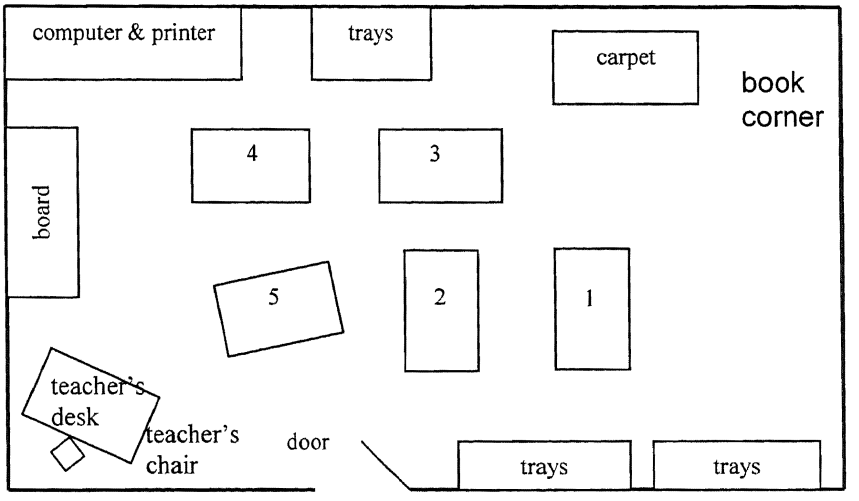
1 = high achieving table to 5 = lowest achieving table

School B
Teacher: Richard
Year: 2
Achievement group: Mixed

Week	General Topic	Oral/mental step	Main activity	Plenary
Wk 1	Problems involving 'real life' - money	Number bingo – adding numbers under 10	Finding combinations of coins which make a specific total	Teacher revises answers of task of the day
Wk 2	Problems involving 'real life' - time	Counting up and down in fives	The children draw their own clocks with different ways to say the time written on them	The tables are pushed to the side of the room and the children pretend to be a clock in the middle of the floor
Wk 3	Problem solving – money	Children play a game called 'around the world' where they have to do mental arithmetic	Children answer questions about 'real life' situations where they would use money	Teacher revises the answers to the questions.
Wk 4	Problems involving 'real life' - time	Children revise the clocks they drew in their books previously as a class	The children as a class practice telling the time	No separate plenary
Wk 5	Calculation	Using pencils to divide numbers	Division of numbers under 100	Some children asked by the teacher to make up a

				problem requiring division
Wk 6	Calculation	None	Children work in groups on a problem	No separate plenary
Wk 7	Data Handling	Children estimate numbers	Children colour in block graphs	No separate plenary

Diagram of the classroom layout observed in school B, year 2, mixed achievers.

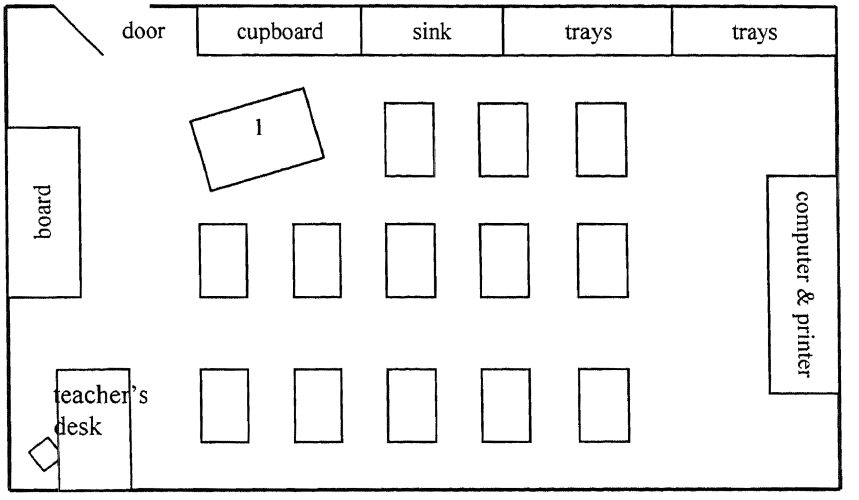


1 = high achieving table to 5 = lowest achieving table

School B
Teacher: Chris
Year: 6
Achievement group: Low

Week	General Topic	Oral/mental step	Main activity	Plenary
Wk 1	Measure	Times table test	Worksheet with questions about cm measurement on	No separate plenary
Wk 2	Measure	Times table test	Using an angle measure to work out degrees of various shapes	No separate plenary
Wk 3	Calculation	Children play a numeracy game called 'around the world' involving mental arithmetic	Children are split into teams and continue to play a game involving mental arithmetic	No separate plenary

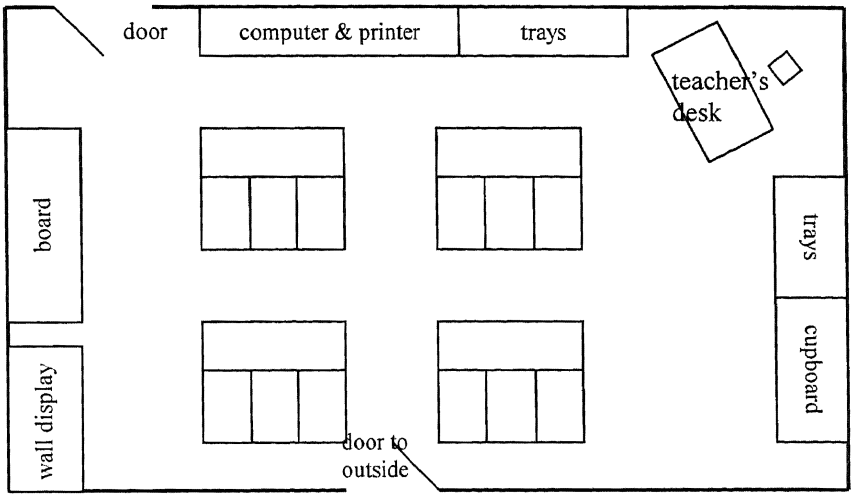
Diagram of the classroom layout observed in school B, year 6, low achievers.



School B
Teacher: Susan
Year: 6
Achievement group: High

Week	General Topic	Oral/mental step	Main activity	Plenary
Wk 1	Data Handling	Mental arithmetic test	Children work in groups to collect frequencies of their chosen subject	No separate plenary
Wk 2	Measure	None	Doing an investigation about angles of a triangle	No separate plenary
Wk 3	Problems involving 'real life' - time	None	Worksheet with questions about time and distance	No separate plenary

Diagram of the classroom layout observed in school B, year 6, high achievers.



8.2. Parent Interview

This interview is about homework and schoolwork in maths.

In the first part of this interview I will ask you repeatedly to recount situations in which you have had certain experiences education and school for you and your child.

1. Parental representations of education in general and of their child's home mathematics learning and homework:

1.1 What does the word education mean to you? What do you associate with the word education?

1.2 What does the word school education mean to you? Explain to me what you think school education is about.

1.3 Does your child bring any maths homework home? Can you tell me about what he has been doing recently?

1.4 How happy do you feel with the amount of homework that [..] brings home? What would be an ideal amount for you?

1.5 Is there any type of homework you would like to see more of? Can you tell me about that if there is?

1.6 When would you recommend parents start doing educational activities with their children?

1.7 Could you describe for me what happens when your child brings homework home? Such as, when they do it and who with

1.8 Is the way you help with their homework different now from when they were younger? Can you tell me about that?

1.9 Do you ever do your own work at home with them? Can you describe the type of things you would do?

1.1.0 Would you say that on the whole your child enjoys their maths homework? Describe to me a situation when that was the case.

1.1.1 What is your earliest memory of doing sums with your child? Can you tell me a situation about that?

1.1.2 How important is your child's education to you? What are your hopes for them?

1.1.3 Does your child play with any games that involve maths? Can you tell me about them?

1.1.4 Does your child get involved with counting money or doing the shopping, everyday activities that might involve maths? Could you describe some of those situations?

1.1.5 Do you have a computer at home? What sort of things are on there for the children?

1.1.6 Has your child done any SAT's exams. Describe to me how did you feel about the exams

1.1.7 Does your child take part in any activities outside of school? Could you tell me about them?

2. Parents' own past experiences of their home and school education and in particular, their mathematics learning:

2.1 How far have you gone with your formal education? Would you describe for me what made you make the decisions you made?

2.2 Was there any particular subject you enjoyed at school? Can you tell me about that?

2.3 Was maths at school a positive or negative thing for you? Please tell me about a situation that was typical of that?

2.4 What are your memories of being at school? Can you describe some of them for me?

2.5 Has your school experience affected the way you approach learning with your own child? Could you give me some examples?

2.6 Would you say that school is very different for your own children than it was for you? Could you describe it what ways it is different or the same?

2.7 How confident do you feel when helping them with their homework now they are getting older? Can you tell me about a situation about that?

2.8 Thinking about maths, what role does maths play for you in your everyday life? Can you give me some examples of how you use maths in everyday life?

3. Parental representations of their child's school and their levels of involvement in school activities:

3.1 How well informed do you feel about [..] education? Could you tell me about a situation where you would have liked more information about your child

3.2 Could you describe for me what you know about your child's day from when they arrive? Describe to me what you know about the sequence of events.

3.3 Have you ever tried to find out more about what they learn in school? Where do you go to get that information?

3.4 Do you know how well [..] is doing at school? And can you describe to me how you found out?

3.5 Do you get a written report? Are you pleased with what is in them, describe that for me

3.6 Do you get to see their schoolbooks and how do you feel about the work you see in them?

3.7 How often do you get to see your child's teacher? Could you tell me about a meeting with the teacher?

3.8 Are the meetings you have with the school useful? Can you give me an example of that?

3.9 Have you had any experience working within the school, if so, has that experience helped you with your own children's education? Please tell me about a situation in which it has.

3.1.1 In what other ways has being part of the school environment influenced with your own children? Tell me about that.

3.1.2 Do you take part in school events? Describe for me any events that you enjoy being part of.

3.1.3 Does the work you do now help with your own child's education? Describe ways in which it might help.

3.1.4 Could you describe to me what the National Curriculum is?

3.1.5 Have you ever received a home-pack or information sheet telling you about the NC?

8.3. Teacher Interview

The project is really looking at home-school relationships, particularly in the context of a multicultural school. In the first part of the interview I will ask you repeatedly to recount situations in which you have had certain experiences about being a teacher and being at school yourself and I will also ask you some questions about the children in your class in relation to their mathematics.

Biographic information:

Name..... Gender..... How long working as a teacher?.....

How long in this school..... Ethnic background.....

1. Teacher's perceptions of parental involvement in the children's school learning.

As you know the government has placed quite a lot of emphasis on home-school relationships...

1.1 In your view, how important is it that parents are involved in their children's school learning? Could you tell me about a situation around that?

[if yes] In what aspects do you think parents should be involved? Could you tell me about that?

[if not] please could you explain to me why you feel that way? Could you tell me about that?

1.2 What is this school's view on increasing the relationship between home and school? Could you describe that for me?

1.3 This is a multicultural school with children from many different backgrounds, from your experience, how does this affect home/school relationships? Could you describe a situation about that?

OR Many of the schools in this town are multicultural, this school is less so, how does this affect home/school relationships? Could you describe that for me?

1.4 In what ways do you prefer to communicate with parents? Could you describe that for me?

2. Teacher's views of mathematics homework

2.1. How do you feel about giving out homework? What are your general feelings about that?

2.2. How do you feel about mathematics homework in particular? Describe to me your feelings about that.

2.3. I have a quote here from another teacher that I interviewed, would you read it and tell me...How do you feel about the opinion presented here?

Vignette

In your view how important is it that parents are involved in their children's school learning? Could you tell me about that?
T: Well, I do think it's important that they're involved, obviously. But I'm not sure whether homework is the right way forward. I have, um, and this is purely personal, I have a real antipathy towards homework for children on this age. I would much rather that the parents were helping the children in general ways, to learn. For example, if they wanted their maths to improve, I'd much rather see them taking their children shopping and talking to the children about, 'oh, you know, these apples are £1.50 and kilo, you know, how many do you think we're going to get', and just bringing mathematics into their everyday life. I tend, I do find in this school, and I don't know whether it's a generalisation, you know, or whether its true everywhere, but the parents tend to want a sheet of sums, where the children can sit down and they can do a column of adding and a column of taking away and a column of times and they quite often see it as a, something to keep the children quiet and keep them occupied. But I'd much rather them doing more meaningful activities

End of Vignette

2.4. Do you think that practical work is more beneficial at home than the more traditional academic work, can you describe how you feel about it?

2.5. Which type of work do you perceive as being more appropriate for parents to do at home, can you describe that for me?

2.6. Have you been using the National Numeracy strategy at this school? What are your feelings about it?

2.7. Do you think that the NNS involves the parents more? Can you describe that for me?

2.8. How do you think parents feel about mathematics homework? Can you tell me about that?

2.9. Do parents approach you about issues to do with their children's mathematics homework? Can you describe to me a situation where that has been the case?

2.10. Do you think that parents understand the level that their children are achieving at in their mathematics learning? Can you tell me about that?

3. Teachers' understandings of children's mathematics learning in relation to their home background

3.1. Why do you think that some children do better in their mathematics than others? Can you tell me about that?

3.2. Do you think that there any aspects of the home background, which may affect their mathematics? Can you tell me about them if there are?

3.3. Do you think that children bring different ways of doing or learning mathematics from home? Can you describe for me a situation where that has been the case?

3.4. Are there particular mathematics strategies that you recognise as coming from the home? Can you tell me about them?

4. Teachers' representations of the children in the class based on achievement and parental involvement

What I really need for this study is to choose three children from your class that are high and low achievers in mathematics and well as have parents who you consider to be either high or low involvement. But also from a multicultural perspective

4.1. Can you tell me about some of the children in your class who are particularly high achieving? Could you describe them for me?

4.2. Could you tell me about any of the children who aren't achieving well. Could you describe them for me?

4.3. Are there any parents of children in your class who you perceive as having high levels of involvement in their children's mathematics or homework in general? Can you describe them for me? [1]

---

[1] Involvement:
1) Directly in homework/academic work
2) Home as a learning environment for mathematics
3) General involvement in the child's school life
4) Emotional involvement in their child's education

4.4. Do you think that it makes a difference to the child's mathematics if their parents are more highly involved? Can you tell me about it?

4.5. Could you tell me about some parents who your perceive as having low levels of involvement in their children's mathematics? Describe them to me?

5. Teachers' own experiences of their individual learning and teaching of mathematics.

5.1. How long have you been working as a teacher? Can you describe to me how much things have changed in that time?

5.2. What are your experiences of working in a multicultural school? Can you tell me about them?

5.3. Do you speak any community languages and have you had other experiences of working with children of different ethnic groups? Could you describe those?

5.4. Have you ever been abroad to the countries where some of the ethnic minority children come from? Could you describe that?

5.5. What are your memories of being at school? Can you describe some of them for me?

5.6. Can you tell me your own feelings about mathematics? Describe your experiences of that?

5.7. Was maths at school a positive or negative thing for you? Please tell me about a situation that was typical of that?

5.8. [If parent] Has the experience being a teacher helped with your own children's education? Please tell me about a situation in which it has.

8.4. Child Interview

In this interview I am going to ask you to tell me about different things at school and at home that have to do with maths. Is that ok?

1. General feelings about school education

1.1 Do you know why you have to go to school? Can you tell me about it?

1.2 Do you like school? Describe to me why you feel that way?

1.3 What is your favourite subject? Can you tell me why you like it?

1.4 What is your least favourite subject? Describe for me why you don't like it?

1.5 What subject do you feel that you are best at? Why do you feel that way?

1.6 What subject do you feel is your worst subject? Why do you feel that way?

1.7 Do you think that children of your age should be given homework? Why do you think that?

1.8 Could you tell me about a typical school day? Describe for me what happens from when you arrive.

2. Maths in particular

2.1 Do you take maths homework home? Can you tell me about what you are doing at the moment?

2.2 What do you like best about maths? Why did you choose that?

2.3 What do you like least about maths? Why did you choose that?

2.4 How do you think that maths can help you in everyday life? Could you describe ways that it could?

2.5 Some children are better at mathematics than other children. Can you describe for me why you think those children are good at maths?

2.6 Some children have more difficulties with their maths. Can you describe for me why you think those children are good at maths?

3. Child and parents

3.1 Does anyone in your family help you with your maths homework? Can you tell me about that?

3.2 Does the person explain it in the same way as your teacher? Can you tell me about any differences?

3.3 Does the person who helps you do the sums in the same way as you are learning at school? Can you describe that for me? [which is the proper way?]

[Maybe for the older children] Do you think your parents understand what you do during your school day? Can you describe that for me?

3.4 Do you know what you would like to do when you grow up? Can you describe that for me?

3.5 Do you know what your mother and dad would like to see you do? Can you tell me if you know?

3.6 Do you think that your mother and dad liked school? Can you tell me about that?

4. Child's life outside of school

4.1 Do you go to any classes outside of school? Can you tell me about it if you do?

4.2 Do you play any games at home that have anything to do with numbers? Can you describe them for me?

8.5. Child Identity Task

Together we are going to make up a story about two boys/girls in this school. I want to learn what these children think about maths at school and home. One boy/girl is good at maths and one boy/ girl is not good at maths. I will start the story

1. The boy/girl who was good at maths was called.....Like all children ..... Had to go to school
    * Do you think ..... liked school
    * Why do you think .... felt that way

2. One day at school .... felt bad about something
    * What do you think .... felt bad about
        Subject = why didn't they like it, what made them feel that way
        Social = what are friends like

3. Like all children .... had to go to school
    * What did .... think about maths
    * What did the teacher think about ..... and his/her maths
    * Were ..... friends good at maths

4. At the end of the school day ..... went home
    * What is .... family like
    * Who is in this family
    * How does ..... feel about his/her family
    * Would .... like anyone else in their family
        Describe in more detail what so-and-so is like

5. When ..... arrived home he/she shut the front door
    * What did .... like to do as soon as he/she got home
    * What was .... favourite thing about being at home

6. On this particular day the teacher had given ..... and his/her class some maths homework to take home
    * Did ..... do his/her maths homework
    * Did ..... ever ask for help
    * Was there anyone at home who would help with the maths
    * What about the rest of the family

- Now we are going to do the story for this boy/girl who is not good at maths. We shall call him/her .....

1. The boy/girl who was not good at maths was called.....Like all children ..... Had to go to school
    * Do you think ..... liked school
    * Why do you think .... felt that way

2. One day at school .... felt bad about something

* What do you think .... felt bad about

Subject = why didn't they like it, what made them feel that way
Social = what are friends like

3. Like all children .... had to go to school

* What did .... think about maths
* What did the teacher think about ..... and his/her maths
* Were ..... friends good at maths

4. At the end of the school day ..... went home

* What is .... family like
* Who is in this family
* How does ..... feel about his/her family
* Would .... like anyone else in their family

Describe in more detail what so-and-so is like

5. When ..... arrived home he/she shut the front door

* What did .... like to do as soon as he/she got home
* What was .... favourite thing about being at home

6. On this particular day the teacher had given ..... and his/her class some maths homework to take home

* Did ..... do his/her maths homework
* Did ..... ever ask for help *(if they were really stuck who would they ask for help)*
* Was there anyone at home who would help with the maths
* What about the rest of the family

7. What is life like for .....

- That was a really good story

* Which boy/girl do you think is like you
* What ways do you think you are similar to .....
* When you described ..... family, was that anything like your family
* How did you know that ..... was good/not good at maths
* Do your parents think your are good at maths
* Do your friends think the same
* How do you know what people think of your maths
* How old was the child in your story

8.6. Teacher Profiles

Catherine

Catherine was a white British teacher who had qualified in 1970 and had been working for thirty-one years. She had worked in school A (year 2) for twelve years, having taken a break from teaching to bring up her children. She mentioned during her interview the changing nature of the school population during those years, as the local area had become increasingly multicultural. She had a strict approach towards the children and the following quote from her perhaps characterised her philosophy towards parenting and the child's school learning

> Catherine: I think this helps for your children, you don't mollycoddle them. You'll say well, you know, if the teachers told you off 'well, she must have done it for a purpose', you know. You must have been doing something wrong and things like that

She had one daughter who was grown up.

Jane

Jane was born in England, although her mother was Irish and her father from Spanish/Russian decent. She had qualified as a teacher four years previous to the interview but had been teaching in school A (year 2) for two years. Before starting a career in teaching Jane had been a Regional Catering Manager. While doing some A'levels, a course tutor had recommended that she go to university and suggested to her that she would make a good teacher. She considered that embarking on her teacher training as a mature student was something positive and

made her a better teacher because of her 'real-world' experience. She had a son in year four (age 8/9 years).

Anna

A white British teacher, Anna had been working at school A (year 6) for twelve years and had qualified fifteen previous to the interview. Anna also commented on the change in the cultural diversity of the children and was keen to focus on the positive aspects of that diversity (see chapter five). She had two young children aged four and six years.

Mary

Mary was a white British/Irish teacher who had been working at school A (year 6) for five months. She had been working as a teacher for nine years. Unlike any of the other teachers, Mary invited me to do the interview in her home after school hours. All of her former teaching experience had been in Independent schools following becoming qualified. Her expertise and qualifications were in theology. Mary did not have her own class but was employed to take some of the low achieving numeracy groups in various years. This meant she had very little contact with parents and was fairly uncomfortable with this situation. Unlike the other teachers she tended to be slightly nervous about my presence in the classroom.

Richard

Richard was a white British teacher who had been working at school B for two years; he had been working as a teacher for nine years. Richard had worked in many other schools and enjoyed moving to different positions in local schools. At the time of the interview he had gained a position at another school and planned to leave school B (year 2) at the end of the academic year. He had taught in schools where there were many different types of cultural mixes. He spoke at great lengths about his father's positive influence on his mathematics learning and was the only teacher to talk about his parents in any detail. Mathematics had been his strongest subject at school until he got to A'level, when he no longer felt the same interest in the subject. He liked to incorporate humour into his lessons and tended to be quite creative in his delivery. He had no children.

Susan

Susan (white British) had worked as a teacher for twenty-three years and had been at school B (year 6) for fourteen years. Susan had worked in a number of different schools, which ranged from small village schools to larger inner city school. She also had quite a lot of previous experience working with ethnic minority children. Mathematics had been one of her strongest subjects at school although she had felt no desire to carry on the subject for A'level. She had two daughters who were both teenagers. She spoke at length about one of her daughters having dyslexia and the problems she faced trying to persuade other colleagues of the issue.

Chris

Craig was a white American who had worked as a teacher for three years in the United States and then moved to Britain, where he had spent one year re-training and one year at school B. He was married to a British woman. After working as a supply teacher for three years in the United States Chris went into children's publishing. Following the birth of this son he stayed at home as a full time parent until his son went to pre-school. He said that mathematics was one of his weakest subjects but he strived to be a 'dynamic' teacher that pupils would remember when they looked back on their school days. During his teacher training in Britain Chris had worked in some of the more multicultural schools in the area and drew on these experiences during the interview.

Shazia

Shazia was a Pakistani-Kashmiri teacher who worked in a school that predominantly consisted of South Asian parents and children. She was interviewed as part of the large-scale pilot study and taught children in year 6. The mathematics group that she taught was mixed in ability ranging from high to low achievement. She had worked as a classroom assistant for eleven years and had been promoted in the previous year to class teacher. She was the third generation in her family to live in England. She described her family as 'ahead of their time' in their day as her mother worked as well as learnt to drive; something Shazia said was rare then. Similarly Shazia's father taught her many skills from cooking to mechanics. She had two children.

8.7. Parent Profiles

Nimrat's mother (Pilot; year 6, high achiever)

A second-generation Indian mother, she was 40 years old and the mother of mixed gender twins. She was educated to A'level standard and was a qualified radiographer, although she now worked as a classroom assistant in the infant school, which Nimrat attended. She was also a parent governor at her children's school, although she didn't consider the role contributed to helping with their education because she had only being been in the position for a short while. Her husband was an electronics engineer and was educated to Masters level. She recalled many successes at school and consistently achieved well, although she did not feel mathematics was a strong subject for her. Nimrat had a twin sister who also achieved well in mathematics at school, but did not excel to the same extent as Nimrat. All the members of the family spoke English at home.

Fazain's mother (Pilot; year 6, low achiever)

Fazain's mother was a first generation Pakistani mother aged 30 years old. She was born in Britain but moved to Pakistan when she was five months old and educated there, coming to Britain when she married a British-born Pakistani man. Her husband was a machine operator. She currently worked as a classroom assistant at a local primary school and attended college courses. Fazain was the middle child of three, having an older brother and younger sister. Fazain spoke a mixture of English and Urdu with his parents and siblings at home.

Elena's mother (Pilot; year 6, low achiever)

Elena's mother was 38 years old and was born and educated in France, but left school before taking any exams. Elena's father was Italian and worked at an airport and left school at fourteen years old. Her mother and father were now divorced and Elena did not often see her father. Elena's mother currently worked as Head Housekeeper in a local hotel. Elena was the youngest of three children, having two older brothers. English was the dominating language spoken at home

Michael's mother (School A; year 2, high achiever)

The interviewee was a female, White British mother who was 48 years old. Micheal was her only child and she was a housewife and Chairperson of a local pre-school. She was married to a Consultant Telecoms Engineer and both her and her husband had left school at sixteen years old, although her husband had later gone on to do a college apprenticeship. Her father had died when she was eight years old and her mother subsequently died when she was sixteen; these events strongly influenced the educational choices she made. She was a very inquisitive mother who was quite critical about the school and Michaels education in general. Her first question had been to ask why I had chosen to interview Michael.

James's mother (School A; year 2, high achiever)

James's mother was White British and had two children. James was the oldest of two and his mother was 36 years old. She was married to a high school mathematics teacher and she was an Information Scientist. James's father had two

degrees; one in mathematics and one in theology and his mother had a degree in chemistry. Religion was a big part of the family's life.

Dima's mother (School A; year 2, high achiever)

Dima's mother (33 years old) was White British and her father Malaysian Chinese. Her parents were divorced and Dima rarely saw her father. Dima's mother was currently a housewife but was qualified to City and Guilds in Design. Dima was the youngest of three girls. Her mother described the house as 'chaotic' and she expressed that she had some problem with depression, which she felt affected the running of the house and her daughter's lives.

Rajesh's mother (School A; year 2, low achiever)

A second-generation Indian mother, she was 33 years old and the mother of two children; Rajesh was the oldest of two children. She spent her early years in Bolton before moving to the town in which this study was conducted. She worked as a housewife during the week and in a factory at the weekend. Her husband was also a factory worker and he had been educated in India. She left before taking any exams because she went to work in her parents' shop to help them out. She expressed insecurity about her own education and felt that her parents didn't give her the support she needed to succeed at school.

Jamal's mother (School A; year 2, high achiever)

A second-generation Bangladeshi family, Jamal's mother was 25 years old. She was born and grew up in the town in which the data was collected and was

currently a housewife and undergoing courses at college. Her husband worked as a service advisor at a local car dealership, and was educated to college standard in engineering and computing. Jamal was the oldest of two boys, his younger brother being four years old.

Dale's mother and stepdad (School A; year 6, low achiever)

Dale was an only child to white British parents. His mother was 34 years old and had grown up in Scotland before moving down South as an adult and his stepfather was 50 years of age and originally from Plymouth. Both worked as civil servants, she was a court clerk and he was a Bailiff. Dale did occasionally see his birth father but he lived in Ireland. Dale's mother had three A'levels and his stepfather had left school with no formal qualifications. There was a strong emphasis in the house on developing Dale's moral upbringing.

Amira's mother (School A; year 6, low achievers)

Amira's mother was 38 years old and has moved to the United Kingdom when she was 9 years old. She was a housewife looking after 4 children, Amira was the 2nd of four children. Her eldest son was 16 years old and she had two young children of 2 years and 8 months. She had done typing at college before getting married and her husband, who was a taxi driver, had no education.

Louise's father (School A; year 6, high achiever)

Louise was the 5th of 5 children and her father was 46 years old. Her mother had passed away and her father was a full time carer for the children because his eldest

son had muscular dystrophy. He was trained as an engineer to City and Guilds standard.

Monifa's father (School A; year 6, high achiever)

Monifa's father was 40 years old and had been born in the United Kingdom. His family moved to Nigeria when he was 7 years old where he had been educated. Both Monifa's mother and father had been educated to degree level and her father had gone on to do a number of other computer related courses. He was now employed as an I.T. Director and her mother was a self-employed party organiser. Monifa was the first of two children; she had a younger sister.

Simon's mother (School B; year 2, high achiever)

Simon's mother and father were White British, and born in the town where the data collection for the present study took place. She was 41 years old and worked as a midwife. Her husband was a civil engineer and educated to degree standard. Simon was the second of two children, having an older sister who was in year four (age 8/9 years).

Jennifer's mother (School B; year 2, high achiever)

The daughter of a White British couple, Jennifer was an only child. Her mother was 37 years of age and was educated to degree standard in a banking course. She currently worked as a childminder and her husband, a qualified mechanic, worked as a service advisor in a garage.

Amy's mother (School B; year 2, low achiever)

Amy's mother and father were White British and had been born in the town where the study took place. Her mother was 36 years old and was qualified to work as a nursery nurse. At the time of the interview she was a housewife and full time mother to Amy's younger sister; who was one year old. Amy's father worked as an electrician.

Samuel's mother (School B; year 2, high achiever)

Samuel was born mixed heritage, his mother being Black Caribbean and his father was White British. Samuel's mother, at 44 years old, was born and grew up in Britain. Her parents had moved to Britain from Barbados. She currently worked as a Learning Support Assistant in a local high school, but was qualified to work as a nurse. Samuel's father was a local government employee and youth worker and was educated to degree standard. Samuel's father was a parent governor at School B, and also played a key role in the parent/teachers association raising money for the school. Samuel was the oldest of three children and had two younger sisters.

Lee's mother (School B; year 6, low achiever)

A 35 year old mother of two, Lee's mother worked as a kitchen assistant at the local high school. Lee's father worked as a mechanic. Lee was the second of two children, having an older sister who was currently at high school.

Jack's mother (School B; year 6, high achiever)

Born to White British parents, Jack's mother was a 42-year-old finance assistant. Jack's father worked as an aircraft engineer. Jack was the oldest of three boys and was highly successful in his school mathematics. Jack was one of four children to take an extra paper for his mathematics SATs examination, but was the only one of those children to pass at level 6. His parents had coached him a little at home prior to taking the exam so that he was prepared for the standard of questions he would do. His mother did not understand where his ability in mathematics had come from, since her middle son was struggling to achieve in the same subject.

Natasha's mother (School B; year 6, low achiever)

Natasha's parents were White British, and her mother was 43 years old. She was a qualified secretary and her husband was a Programmes Manager, with a degree in computer science. Natasha had an older sister who was currently at high school.

Anthony's mother and father (School B; year 6, high achiever)

Anthony's parents were White British and had lived in the town in which the data was collected all their lives. Anthony's mother was 37 years of age and was currently working as a personal assistant. She had qualified as a secretary at college. His father was 40 years of age and had undergone an apprenticeship in engineering after he left school. He currently worked as a courier. Anthony was the youngest of two; his sister was now in high school.

Sumana's mother (School B; year 6, high achiever)

Sumana's mother was a second-generation Indian woman, aged 37 years old. She had been born in London but currently resided in the town where the research programme took place. She was a qualified secretary but currently worked at a further education college as a training officer. Her husband was currently unemployed and was educated to A'level standards in Pakistan. Sumana was the second of four children. One older brother attended college, and her two younger brothers were in private education. Sumana's mother was hoping her daughter would pass the entrance exams to an independent senior school.

Adam's mother and stepdad (School B; year 6, low achiever)

White British, Adam's mother was 33 years old with two children from a previous marriage. Adam was the oldest of two boys. She was now married to Adam's stepfather who was 28 years old and from Ethiopia. His mother was an administrator in an opticians and his stepfather was a office clerk. She had started to do her teacher training but was forced to give up when she divorced from her husband and needed to start work. She had also gone back to college to redo her GCSE mathematics but had also given that up at about the same time. As a child she had moved schools a great deal because her father was in the armed forces. She regretted the fact that her own sons have moved school a great deal as well, knowing the affect that it had on her own education.

8.8. Parent consent

Dear Parent,

Thank you for agreeing to take part in this study. This study aims to look at home-school relationships and homework, with a particular emphasis on mathematics.

Your participation is entirely voluntary and you may withdraw at any time. The information you and your child provide will be used for research purposes only and neither the name of you, your child, the school or the town in which it is located will be divulged to others. Therefore, this information is entirely confidential.

Please could you sign below agreeing that you are happy to take part.

Name of parent:.....

Signature:.....

Name of child:.....

Interviewer:

Date:

Reference No: